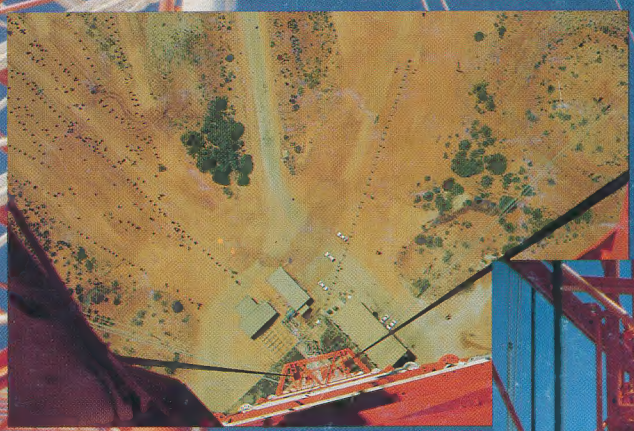
AMATEUR RADIO

FEBRUARY 1990 RRP $3

Special Data Reference Issue



WIRELESS INSTITUTE OF AUSTRALIA

THE WIA RADIO AMATEUR'S JOURNAL

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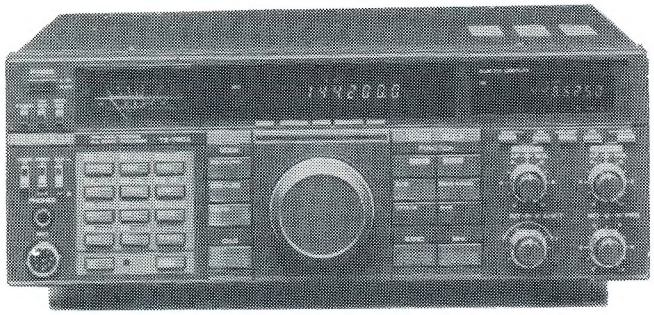

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AMATEUR RADIO

THE WIA RADIO AMATEURS JOURNAL

Vol 58 No 2 ISSN 0002-6859 February 1990

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Cover

Our Feb cover shows the antenna mast for 2m repeater VK6REX at Exmouth Gulf, and a view from the platform 30 feet from the mast's top. Seriously, VK6REX is sited on Tower Zero at the joint Australia — US Naval Communications Station Harold E Holt near Northwest Cape. At a height of 1,275 feet (389m) it is the highest repeater antenna on a man-made structure in Australia. Ken VK3AJU who took the photos said that he went to the tower top like a lion and came down like a lamb! The view however was magnificent!

Many Hands

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Many hands make light work, according to the old proverb. No doubt that the converse also applies, particularly to the activities of the WIA, almost all of which are critically dependent on voluntary effort to get them done. One of the more successful of these activities is WICEN, some of its doings being recorded from time to time in our occasional column of WICEN News.

WICEN really "gets going" in major national disasters such as bushfires and floods, cyclones and now even earthquakes. Until Newcastle a few weeks ago, we thought Australia had some kind of immunity from damaging earthquakes, but now we know better. In any of these emergencies, as soon as regular public communication links are overloaded or interrupted, WICEN may be called into action to provide emergency communications, either local or Australia wide.

Provision of such a volunteer service needs a substantial number of enthusiastic volunteers, having the right kind of equipment available at short notice, and trained in its use according to standard operating procedures. This is achieved by provision on a regular basis of communications to various charitable or sporting activities. Here in VK3, the Great Victorian Bike Ride, the Red Cross Murray River Canoe Marathon, the Marlay Point Overnight Sailing Race, Walk against Want, and various Fun Runs and car trials are all helped by WICEN communications, and in turn WICEN participants obtain "hands-on" operating experience.

Would you like to be part of such an active and enthusiastic group? Find who your local WICEN area people are, and I'm sure they will welcome you. There are too many names for me to list here, but a few queries around the bands or channels should tell you what you need to know. I hope you can help WICEN more than I've been able to over the last few years. Every time an exercise is programmed, it always seems to clash with an urgent AR job like proof-reading or whatever!

Not only WICEN needs more volunteers. There is an urgent need for Melbourne-based members of Executive. At least two are needed to take some of the load off the too-few hands we have now. And someone qualified in accountancy would be more than welcome to fill the vacant position of Federal Treasurer. Few hands make heavy work. We know it only too well, but we'd love to experience the converse. It would be a pleasant change! **ar**

"YES, YES, OM - NOW YOU'RE 5/9+!"

Bill Martin VK2COP

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910
Representing Australian Radio Amateurs - Member of the International Amateur Radio Union
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Reference Issue

Following a practice started last year, this issue of Amateur Radio is the annual "Reference Issue".

In order to incorporate the number of pages required for the data section, the editors have had to cut down in other areas of the magazine.

That includes WIA NEWS!

Amateur Radio Awards

One of the more difficult tasks of the Amateur Radio Publications Committee each year is the selection of the winners of the three magazine awards.

After much deliberation at the December meeting of the Committee, the following winners were selected for 1989.

The **Technical Award**, for the best technical article published during the year, was awarded to **Peter Stackpole, VK1RX** for his article "Sporadic E Propagation" that was published in the June issue of Amateur Radio. Peter received a cheque for $100.00.

The **Al Shawsmith Journalistic Award**, for the article on a radio theme considered best to display literary merit, was awarded to **Barrie Gillings, VK2DWC**. Barrie's article "They Say It Never Strikes Twice in the Same Place" appeared in the November issue of our magazine, and he received an engraved wall plaque as well as a cheque for $100.00.

The **Higginbotham Award**, for meritorious service to amateur radio generally, was awarded to **Eric Jamieson, VK5LP** because of his contribution to VHF/UHF. Eric's "VHF/UHF - An Expanding World" column has appeared in Amateur Radio each month over the past 20 years. A cheque for $100.00 has been presented to Eric.

It is only through the efforts of many members of the WIA, such as these three award winners, that Amateur Radio magazine is such an interesting and informative magazine. Therefore, it is a pleasure for the WIA to be able to recognise people such as these three in this manner, and tangibly reward their efforts.

Are you going to be eligible for any of these prestigious awards in 1990?

First Devolved Exams

A note from Meg Box, VK5AOV, Secretary of the Adelaide Hills Amateur Radio Society, advises that on Saturday, 25th November 1989, the Adelaide Hills ARS conducted the first amateur radio examinations to be held by a body other than the DoTC.

Congratulations to the two persons who gained their Full Theory, the only successful candidates on this occasion.

WIA NEWS

BILL ROPER VK3ARZ GENERAL MANAGER & SECRETARY

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1990 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Ted Pearce Jan Burrell Ken Ray	VK1AOP VK1BR VK1KEN	3.570 MHz 2m ch 6950 70cm ch 8525 2000 hrs Sun	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Peter Balnaves David Horsfall Mon-Fri 11.00 - 14.00 Wed 19.00 - 21.00)	VK2ZIG VK2CZX VK2KFU	(R Denotes repeater) Times 1045 and 1915 on Sunday 1.845 MHz AM, 3.595 SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52 120 SSB 52.525 FM 144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) $59.00 (G) (S) $47.00 (X) $33.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	David Jones John Aarsse Eric Fittock	VK4NLV VK4QA VK4NEF	1.825, 3.605, 7.118, 14.342, 18.132, 21.175, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Don McDonald Hans van der Zalm Bill Wardrop	VK5ADD VK5KHZ VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North (NT)3.555, 146.500, 0900 hrs Sunday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 474 2626	President Secretary Treasurer	Alyn Maschette Bruce Hedland - Thomas	VK6KWN VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) $56.00 (G) (S) $45.00 (X) $30.00
VK7	Tasmanian Division PO Box 1010 Launceston TAS 7250	President Secretary Treasurer	Mike Wilson Bob Richards Peter King	VK7ZWW VK7NRR VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $63.00 (G) (S) $50.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

These examinations were authorised for trial purposes under the new syllabus, which is not "official" until 21st February 1990, and DoTC will not issue a certificate or licence before that date.

The Adelaide Hills ARS Examinations Officer, Marshall Emm, VK5FN, reports that he was pleased with the way the examinations went. More details can be obtained from Club Corner in this issue of Amateur Radio.

GM4VIR Receives MBE

Scottish radio amateur Alexander Anderson, GM4VIR, was awarded an MBE in this year's United Kingdom New Years Honours List for his work following the Lockerbie Air Disaster.

GM4VIR was co-ordinator of the regional branch of RAYNET, the amateur radio network, which was highly commended by the regional council for its communications after the crash.

It is great to see this public recognition of the valuable service the amateur service provides in times of disasters and emergencies.

More Articles Needed

As readers of Amateur Radio magazine will realise, the articles published in this journal are almost entirely the volunteer efforts of members of the WIA.

Sometimes the editors are inundated with articles submitted for publication, and that has been the case over the past two years or so. Because of this plentiful supply of articles for publication, many authors have had to wait patiently for up to 12 months before seeing the fruits of their labours appear in print.

At other times, such as now, the reserve of articles is so low that the editors may have to consider reprints from other publications.

Therefore, now is the time for you to do what you had been thinking about for a long time, but kept putting off. Writing that article for Amateur Radio magazine!

That different piece of equipment that you built and it worked.

That experiment with an antenna that surprised you with its results.

That useful modification you made to a commercial rig.

That exciting or humorous operating experience.

The list is endless! Share your ideas, discoveries and experiences with other amateurs. Feel the excitement of seeing your efforts in print.

Naturally, it would be ideal if your article was submitted to us in the form of a professional manuscript. But only a small percentage of articles is received in that form.

The Publications Committee has a team of competent technical editors to help you in knocking that idea of yours into shape. There is a professional draftsperson available to redraw your circuits and diagrams if your drawing skills are below a publishable standard.

Send plenty of photographs with your article, preferably black and white prints, but the editors will consider virtually any style of photograph.

Experience the satisfaction of sharing your experiences and ideas with other amateurs, perhaps win an award, perhaps be republished overseas.

Incidentally, digressing for a moment, I wonder how many readers realise that Amateur Radio magazine is one of the most quoted and reprinted amateur radio magazines in the world. Each month I speed read a large number of amateur radio magazines that the WIA receives from overseas, in an attempt to keep abreast of what is happening in our hobby worldwide. Not a month goes by without me noting at least one reference to, or reprint of, an article originally published in our magazine.

So how about it? Dig out your pens, typewriters and cameras. Inundate the editors with a rush of articles for your magazine.

Special June Issue

As mentioned last month, the June 1990 issue of Amateur Radio magazine will be a special "**Test Equipment**" issue. The Editors are looking for articles on construction of test equipment, modification of test equipment, and test procedures for this special issue.

Articles need to be received at this office no later than the middle of March so that the articles can be prepared for publication in the June issue.

A prize will be awarded to the author of the test equipment article which is judged to be the best of those published in this special issue of Amateur Radio magazine. Negotiations are still continuing on just what that prize will be, but it will be very worthwhile.

Have you started writing your test equipment article for June issue of Amateur Radio magazine?

December Front Cover

As anyone who has ever been involved with the publishing of Amateur Radio knows, if the magazine looks great, most readers accept it without comment.

The last few issues of the magazine, which we think are the best published for some time, have produced very little feedback from readers.

However, one of the things that makes the hobby of amateur radio so interesting is that radio amateurs are a very individualistic breed, and cover a broad spectrum of ideas and opinions.

Such was evident with comments received about the front cover of the December 1989 issue.

Many complimentary comments were received about this cover picture. However, we also received a few critical comments.

One comment was most scathing because we did not have a "Christmassy" front cover. Another objected to the "reds and browns" colours predominating as they are "angry and antagonistic colours". Apparently we should only use the "cool" colours of blues and yellows (the January cover was produced before this latter comment was noted). The Amateur Radio colour printing process uses only four colours, and we do not always get the correct tonal reproduction of colours.

Yet another comment indicated concern that Peter Gamble was holding a cordless telephone and not an amateur handheld transceiver. The intent of this aspect of the photograph was to suggest that nearly all the time Peter used to spend enjoying the operating and construction pleasures of amateur radio is now taken up with the demanding and time consuming business of being Federal President of the WIA.

Incidentally, John Friend, VK3ZAB, the Amateur Radio photographer, takes a great photograph, doesn't he?

A final comment expressed disgust at the creation of a "personality cult" by publishing a photograph of the Federal President on the front cover of the magazine. Let me ask you this question. Did you know who was the President of your organisation before you saw the cover of December Amateur Radio magazine?

How does that saying go? "You can only please some of the people some of the time..."

New Members Computer

The membership database computer is an essential part of the operations of the Executive Office of the WIA. Amongst a host of other tasks it maintains a database of members, prints address labels each month for Amateur Radio magazine, prints subscription reminder notices, processes payment of subscriptions, and combines WIA and DoTC records to produce the Call Book listings.

Many years ago, some of these tasks were done under contract by the Monash University EDP Department. When membership of the WIA grew to the stage where it was economically viable to purchase its own computer, after much deliberation a Cromemco CPM computer was purchased and installed.

This computer has given stirling service for many years, but old age has been catching up with it, and hardware failures were

becoming more of a problem.

The last straw occurred a few months ago when we were advised that support for this computer in Australia was no longer available. This meant that, if certain components failed, there could have been delays of up to six weeks before replacement components were supplied.

After initial discussions involving amounts of about $25,000 for a replacement computer and programming, the WIA finally purchased a new computer in November that is now up and running. The total cost for this new computer, streaming tape backup, and professional programming finally came to less than $9,000.

For the information of the computer minded members, the new unit is an IBM clone AT with an 80286 processor running at 26 MHz. It has 1 megabyte of RAM on board, an 80 Mb voice coil hard disk, 1.2 Mb and 360 K floppy drives, a 60 Mb streaming tape cartridge backup unit, and uses a DOS version of Informix 3.3 for most of the membership database related functions.

Probably the most dramatic difference in the new system is that the time for generating the Amateur Radio address label file has been reduced from four hours on the Cromemco to 25 minutes on the AT.

Many of the programs had to be run overnight on the Cromemco. These programs can now be run during office hours, and the computer does not have to be left on each night.

Whereas the Cromemco used to take over five minutes to bring on line from a cold start, the AT can be processing a member query within 60 seconds of switch-on.

Besides this new membership database computer, the three IBM XT clones are still in constant daily use in the Executive Office for wordprocessing, accounting, and a variety of administrative database purposes.

Support Our Advertisers

Any publication such as Amateur Radio magazine depends to a large degree upon its advertisers. As well, the advertisers depend on our magazine.

The WIA is appreciative of the very worthwhile support given to our journal by our advertisers, particularly those advertisers who have been supporting Amateur Radio for many years.

Show your appreciation of these Amateur Radio advertisers by buying all your amateur radio requirements only from them. When you do so, let them know that you also appreciate their continued support for your magazine.

Remember, without these advertisers, Amateur Radio would not survive in its present format.

Member Renewals

If for no other reason, 1989 will be remembered in WIA history as the year when the WIA publicly agonised over the decision to make a quantum increase in the membership fees. The necessity for the fees to "catch-up" arose because the below-CPI increases of the past 10 to 15 years had placed the organisation in a financially difficult situation.

Even so, despite the increase, full membership of most of the Divisions only costs $1.25 a week; and concessional membership only costs $1.00 a week.

With the debate that raged in print and on the air for several months, and the resultant changing of decisions, no one can say that the outcome was not the result of much deliberation, anguish and public discussion.

Each year, when the bulk of members subscription renewals become due, generally about 400 members do not renew, but these dropouts are generally compensated for by the new members gained during the year. Some members advise that they are no longer active in amateur radio for a variety of reasons, some find that in determining their financial priorities the WIA has to miss out, and some resign because they are not happy with some aspect of the WIA.

In the past, most membership renewals were received without comment, and most resignations become known simply because of non-payment of the subscription fee. This year, no doubt because of the long drawn out public debate on the fee increases, it is different. Many members renewing are attaching notes and letters to their remittances. Many more than is usual, of those who are resigning, are letting the WIA know why.

Even though the Executive Office is closed at the time I am writing this, 1619 items of mail have been processed in the past four days. Peter Gamble, the Federal President, and Executive member Brenda Edmonds, have spent two full days in the office this week helping the Executive Office staff in replying to some of these letters.

Many of the letters are encouragingly supportive, such as this one....

"Glad to see that the fee has been raised to be more in line with the professional service that we receive from the WIA.

Amateur Radio can be great fun but could not exist without serious control and representation by WIA, RSGB etc.

Please debit my Visa card with membership $65.00, donation to funds $25.50." Others offer several constructive suggestions and criticisms and, regrettably, a couple have been abusive and offensive, such as the ungentlemanly amateur who sent back his renewal notice with "go to hell" scrawled across it. **ar**

DOTC Interference Investigation Update

The introduction of a $60 up-front charge by DOTC before it investigates individual complaints of broadcast radio and TV reception difficulties will be introduced soon. A recent amendment to the Broadcasting Act passed by Federal Parliament has cleared the way for DOTC to make a charge before it investigates such complaints.

The background to this move was fully explained in AR magazine last July "Interference, spectrum pollution and reception problems".

DOTC has sent copies of its new booklet "Better Television and Radio Reception: Your Self-held Guide" to about 2500 technicians and antenna installers around Australia. This is aimed to boost their knowledge of the causes of reception difficulties, often mistaken for being the result of interference. The booklet was reviewed in the December edition of AR magazine and is available free from DOTC state offices and district radio inspectors.

Phone Patch Deregulation

The interconnection of radio equipment with Telecom's telephone network has been deregulated, but there is still a requirement to use only approved interconnect devices. Telecom has advised that charges for the interconnection of radiocommunications systems will no longer be levied. This followed a decision made by Austel, the independent regulatory body for telecommunications. Telecom had charged amateur radio stations using phone patch facilities an access charge of $2 a month.

Approval from Telecom for connection to its network is no longer required. However all radio amateurs are reminded that only authorised interconnection devices can be used for phone patch. Among the permitted equipment is the WIA Amateur to Telecom line isolation unit (LIU) — a homebrew unit which meets the technical standards needed to isolate radio equipment from the telephone line. The WIA is required to test all of the LIU's to ensure they use the correct components and are constructed in accordance with the required standards.

Around 50 LIU's have been built by radio amateurs, and passed for an approval number after the WIA testing procedure.

JIM LINTON VK3PC

ar

A FEW TIPS ON THE DESIGN OF THE NOISE BRIDGE

LLOYD BUTLER VK5BR
18 OTTAWA AVE PANORAMA 5041

Introduction

This is not intended to be a complete presentation on the noise bridge, which has been well described in amateur radio journals and in particular in articles in the March, April and May 1981 issues of Amateur Radio, by Bob Slutzkin VK3SK. The article does present a few ideas which result from my own experimentation with the noise bridge, and discusses a different type of signal source for the bridge.

The Typical Circuit

A typical noise bridge circuit is that of the Palomar model shown in figure 1. In this and most other noise bridges, a continuous wide band spectrum of noise is generated by passing current through a semiconductor diode. The noise is amplified in a number of transistor stages to a suitable level as a source for the AC bridge. The advantage of the wideband noise is that no tunable oscillator is required and measurement of resistance and reactance can be carried out at the frequency desired, without adjustment of the source. Measurements of the resistance and reactance of an antenna system can easily be made at the actual operating frequency of the antenna.

The output of the bridge is detected by a radio receiver tuned to the operating frequency and the bridge is balanced for a minimum in the noise level output of the receiver or for a dip in its 'S' meter reading.

In using the bridge to measure antenna constants, there is often a problem in resolving the precise null point of the bridge because, as the null is approached, the noise from the bridge is masked by incoming noise received by the antenna. The minimum in level of noise from the bridge is more easily identified, in the presence of antenna noise, if the source is heard as an audio tone. A circuit of a bridge signal source, which adds a tone component, has been published in recent issues of the ARRL Handbook and in the October 1987 issue of QST. In this source, the noise is modulated by an NE555 timer, free running at 1000 Hz. According to the QST article, the tone is heard in the presence of noise when adjustment of the bridge approaches the null. In the following text, I will introduce a different type of wideband signal source which, when detected, produces a strong audio tone in the receiver output.

A Different Signal Source

For the source introduced, the signal is initiated from a 500 Hz square wave oscillator which switches state at high speed to generate harmonics well into the upper HF spectrum. In a perfect square wave, the harmonics are of odd order so that harmonic frequency components are generated at 1000 Hz intervals of frequency. The amplitude of each harmonic component is inversely proportional to its harmonic order so that the third harmonic component is one third the amplitude of the fundamental component, the fifth harmonic component is one fifth the amplitude of the fundamental component and the 'n'th component is one 'n'th the amplitude of the fundamental component. Given that $\Theta = 2\pi ft$, we can express the fundamental and harmonic components as follows:

$$A = a.\text{Sin}\,\Theta + \frac{a.\text{Sin}\,(3.\Theta)}{3} + \frac{a.\text{Sin}\,(5.\Theta)}{5} + \ldots\ldots\ldots + \frac{a.\text{Sin}\,(n.\Theta)}{n}$$

The first term represents the fundamental frequency and each following term represents a harmonic with its relevant denominator dividing by 3, 5 or 'n' & etc.

If we feed the square wave through a differentiating network, we can represent this operation by mathematical differentiation in the previous expression of A with respect to Θ. The derivative of Sin ($n\Theta$) is simply n.Cos ($n\Theta$) and thus our differentiated expression becomes the following:

$$\frac{dA}{d\Theta} = a.\text{Cos}\,\Theta + \frac{3a.\text{Cos}\,(3.\Theta)}{3} + \frac{5a.\text{Cos}\,(5.\Theta)}{5} \ldots\ldots\ldots + \frac{na.\text{Cos}\,(n.\Theta)}{n}$$

It can be seen that in each harmonic term of the expression, the new multiplier in the numerator cancels out the denominator and therefore all harmonic terms have the same amplitude as the fundamental term.

As demonstrated in the previous paragraph, feeding the square wave output through a differentiating network provides a continuous spectrum of equal amplitude harmonic components spaced at 1000 Hz intervals. The network is a simple circuit of series capacitance and shunt resistance and in achieving differentiation, all frequency components are attenuated to the same very low level as that of the highest frequency component. Because of the low level, considerable amplification is needed, following the differentiating network, to raise the level sufficiently to operate the bridge. The system of square wave generation, differentiation and amplification, as a source to feed the bridge, is shown in the block diagram, figure 2.

To carry out the functions described, a single High Speed CMOS Hex Inverter Type 74HCO4 is used as shown in figure 3. The reason for using a CMOS device will be explained when amplification is discussed. The high speed version was selected to handle frequencies well into the high frequency end of the HF band. Inverter sections A and B are used in an astable multivibrator circuit which generates the 500 Hz square wave. Inverter C is a buffer stage which drives the differentiating network C5-R5, the output of which feeds an operational amplifier type of circuit made up of inverters D, E and F.

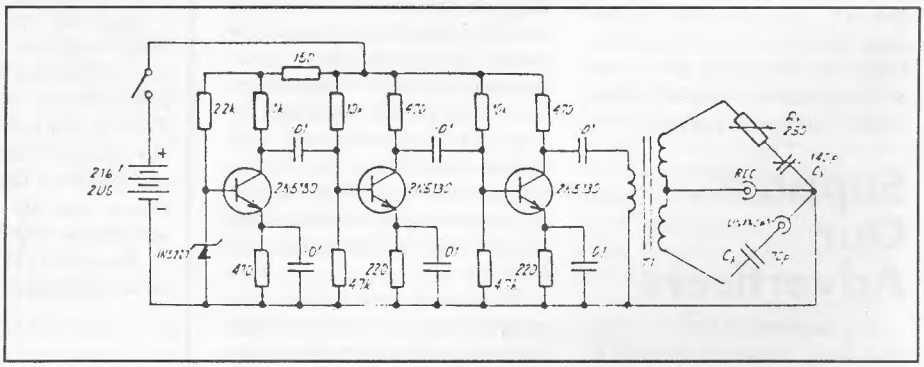

Figure 1 Palomar noise bridge using diode as noise source

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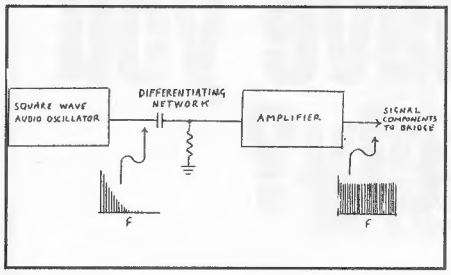


Figure 2 Wideband signal source produced from differentiated audio square wave

Operation of the amplifier requires further explanation. Use of CMOS inverters for linear amplification was described in Dick Smith Electronics publication Experimental Electronics (Aug-Sept, 1984). If negative feedback is applied from the complementary output stage of a CMOS inverter back to its input gate, the output stage operating point centres at a potential between that of its two supply rails and the inverter can operate in a linear mode. The feedback can be applied across one inverter or three inverters for correct phasing. It is important that, as far as DC potentials are concerned, the input gate must float and this is the purpose of C8 in my circuit. The three inverters are connected in tandem to form an operational amplifier type circuit in conjunction with R4 and R6. The resistance ratio of these resistors determines the low frequency gain.

The Dick Smith publication made no reference to the high speed version of CMOS but I soon discovered that, connected as a linear amplifier, this version had a great desire to oscillate in its own right around 50 to 100 MHz. To "tame the beast" and prevent a response peak at high frequencies, components C4, R7, L1 and C7 were added.

The discussion has evolved around a perfect 500 Hz square wave oscillator with only odd harmonic components which, when they beat together in an AM detector, produce 1000 Hz tone. In practical operation, the oscillator shown delivers quite a high level of even harmonics which beat with the odd order harmonics to produce 500 Hz. The audio tone thus sounds more like a 500 Hz tone with composite harmonics.

One aim in designing the circuit was to provide the complete signal source with the one only integrated circuit package shown. This aim was not quite achieved. My original home built noise bridge used the diode noise source based on the type of circuit shown in figure 1. The new tone based source proved to have lower level output than the original noise source and I corrected this level anomaly by feeding the new source through the last transistor amplifier stage of the original noise source. This transistor stage is shown in figure 3 as part of the new complete circuit diagram.

A characteristic of this type of signal source is that, when detected by a radio receiver, the receiver must be set up for AM detection to hear tone. If the receiver is set for single sideband operation with a beat oscillator, noise is heard but not tone. The same characteristic applies to the modulated noise type of signal source which was discussed earlier.

The Bridge Coupling Transformer

Some care has to be taken in making the coupling transformer which must have an accurately balanced secondary to feed the two halves of the bridge. A 9mm toroidal core, with a primary winding of 10 turns and two secondary windings of 10 turns, does the job nicely. Ferrite material with a permeability around 120 is suitable but this is not critical. To obtain high coupling efficiency in such a transformer, it is normally necessary to wind the primary and secondaries together in multifilar form, that is, the three winding wires are first twisted together and then wound on the core as one. Unfortunately, this results in a high capacitance between the primary and secondaries and as the primary is unbalanced, the secondary windings have a reflected capacitance unbalance.

The primary to secondary capacitance can be reduced by winding the primary on one side of the toroidal core and bi-filar winding the secondaries on the opposite side. This is illustrated in figure 4. Unfortunately, this method of winding introduces a high leakage inductance which is reflected back in series with the primary and causes some signal loss. For this particular application, the signal loss is a worthwhile trade-off to reduce capacitance unbalance in the secondaries.

Bridge Components

A general circuit arrangement for the bridge is included in figure 3. Actual capacitance values are not critical as precision is defined by calibration after construction. The main requirement is that the fixed capacitor in series with the 'unknown' has a value near half the maximum capacitance of the variable capacitor in the opposite bridge arm. This ensures that balance for zero reactance at the 'unknown' occurs near the centre of the variable capacitor tuning range and that both positive and negative reactance at the 'unknown' can be balanced either side of the zero.

Because antenna feeder systems are normally arranged to reflect low values of antenna resistance, a low resistance non inductive potentiometer is required to provide good resolution in the variable resistance section of the bridge. Obtaining a suitable potentiometer can be a problem. My original bridge used a 1000 ohm carbon potentiometer with a logarithmic scale and the expanded part of that scale was used to give fine resolution of the low values of resistance. This potentiometer eventually became noisy and I replaced it with a good Allen Bradley 100 ohm linear carbon potentiometer which I had luckily obtained. To extend the range above 100 ohms, I connected in series a small rotary switch which selected one, or any number up to seven, additional 100 ohm resistors. This provided an adjustable range of 0 to 800 ohms. In figure 3, the variable resistance is represented by R12 shown for simplicity as a single resistance.

Assembly

There are several inexpensive boxes made of light gauge aluminium which are distributed by Dick Smith Electronics. The smallest of these nicely houses the noise bridge unit. The potentiometer, variable capacitor, battery switch and connectors for the 'unknown' and the receiver input, must be accessible and are mounted on the box itself. The remainder of the components can be fitted on vero or other type of blank circuit board which is fitted inside the box. The unit is powered by a 9V battery. It is a good idea to wire in an LED

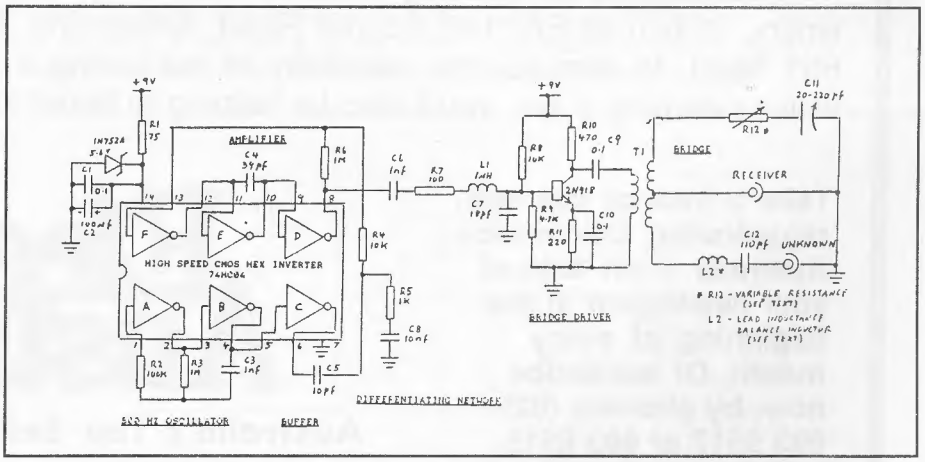


Figure 3 Bridge with wideband signal source to produce a tone on AM demodulation

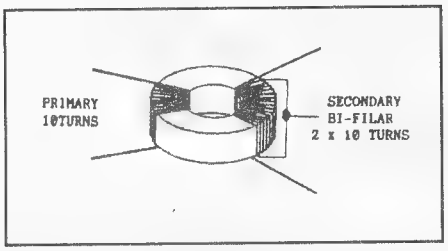


Figure 4 Method of winding primary & secondary on toroidal core

indicator across the power rails to draw attention to the battery load being on. I find that batteries often have to be replaced because I forget to turn equipment off rather than because of extended usage!

Wiring leads in the bridge circuit should be kept as short as possible to minimise lead inductance although it is difficult to avoid some long leads in connecting up the potentiometer and the variable capacitor.

Lead Inductance In The Bridge Arms

Wiring leads in the bridge arm containing the potentiometer and the variable capacitor are likely to be much longer and have much higher inductance than those in the bridge arm containing the connector for the 'unknown'. If the reactance zero setting is to be at the same point on the calibration scale for all frequencies, the inductance in the 'unknown' bridge arm must be increased by lump inductance to make the inductance in both arms equal. I was able to achieve this by adding a small coil of 22 gauge tinned copper formed around a knitting needle. In my own case, the adjustable bridge arm had been complicated by the variable resistance arrangement and had accountable inductance.

To trim the coil, I started with about 12 turns which over-compensated the circuit. Turns were trimmed off until the zero reactance point of the variable capacitor was identical for the extreme frequencies of 2 MHz and 30 MHz. (This was done with a 50 ohm resistance across the 'unknown' terminals and the variable resistance set for balance of the 50 ohms.)

Calibration

Calibration of the variable resistance arm of the bridge is a necessary requirement but is quite easy to carry out. Calibration of the variable capacitance to provide a reactance scale is not quite so straight-forward. If the use of the bridge is only to match up the antenna tuner to reflect 50 ohms resistance to the transmitter, calibration of the capacitance scale might not be needed.

The scale of the variable resistance arm can be calibrated by direct measurement of the potentiometer resistance using a standard DC or low frequency AC resistance bridge or using a digital multimeter set to the ohms scale. The ohms scale of a moving coil multimeter can also be used but this should first be checked against some reference fixed resistors so that correction for any inaccuracy can be made. (Moving coil multimeters are not renowned for their high accuracy on the ohms scale.)

Another method of calibrating the variable resistance scale is to operate the bridge at a normal HF operating frequency and substitute different values of fixed resistor connected as the 'unknown'. In this case, as for normal operation of the bridge, both resistance and capacitance variables are adjusted for a noise null. The capacitance null is the adjustment for zero reactance and from this adjustment, the zero point can be marked on the reactance scale. The resistance scale is marked as defined by the substitution resistors, any additional AC resistance component in the bridge circuit is taken into account and if carried out at extremes of frequencies, it can show up any AC resistance component which varies with frequency. If a good quality carbon or cermet potentiometer is used, this should not occur.

The general practice in noise bridges has been to calibrate the variable capacitor in terms of plus and minus capacitance, as referred to the zero reactance point and provide a calibration curve of reactance at 1 MHz against capacitance. For my own bridge, I thought it was a better idea to eliminate the calibration curve and mark the dial calibration directly in values of reactance at 1 MHz.

To calibrate the reactance scale, the receiver is set to 1 MHz and inductors and capacitors in a range of fixed values are substituted in turn as the 'unknown'. The inductors used set points of positive reactance and capacitors used set points of negative reactance. Using the inductors, both the variable capacitance and variable resistance are adjusted for a null. The variable resistance is needed to balance the loss resistance of the inductor. Using the capacitors, the variable resistance is set to zero, assuming negligible resistance loss in the capacitors.

Tables A and B list preferred values of inductors and capacitors which individually, or in combination with others, give a reactance at 1 MHz close in value to suitable incremental calibration marks. Fixed inductors are not usually a plentiful item in the radio shack and hence the inductors have been restricted to four different values which, in some cases, are series connected to obtain the reactance required. the error factors in using the precise preferred values are also given in the tables. In using 'off the shelf' inductors and capacitors, with a given manufacturer's tolerance, a general accuracy of 10% might be expected. For the purpose of tuning up antennas, this accuracy is probably adequate.

Some Final Remarks

The noise bridge is a very useful addition to the radio shack to assist in matching the aerial system and to determine what impedance components are seen looking into the antenna feeders. It is a simple device which can easily be built by the most inexperienced radio amateur. In its testing and calibration, it is an excellent device for the novice to get the feel of what AC resistance and reactance is all about. It can be calibrated by simple substitution of 'off the shelf' resistors, capacitors and inductors so that other test equipment is not needed.

In providing a few tips on the noise bridge, I have introduced a new idea for a wideband signal source which demodulates as an audio tone rather than wideband noise. Perhaps others, who already have a noise bridge, might like to experiment with this idea. **ar**

Table A

Selection Of 'Off The Shelf' Inductors

Calibration Reactance ohms	Preferred Inductor Value µH	% Error
100	15	6% low
200	33	4% high
300	47	1.6% low
400	47 + 15	3% low
500	47 + 33	0.5% high
600	47 + 33 + 15	0.6% low
700	100 + 15	3% high
800	100 + 33	4% high
900	100 + 47	3% high
1000	100 + 47 + 15	2% high

Table B

Selection Of 'Off The Shelf' Capacitors

Calibration Reactance ohms	Preferred Capacitor Value pF	% Error
100	1500	6% high
200	820	3% low
300	560	5% low
400	390	2% high
500	330	3% low
600	270	2% low
800	200	0.5% low
1000	150	6% high
1500	110	3.5% low
2000	82	3% low
3000	56	5% low

WIA
1990 DATA LIST

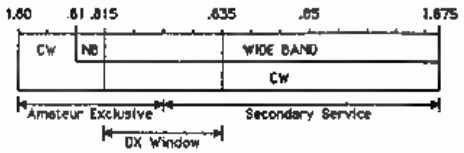
BRUCE R KENDALL VK3WL DATA EDITOR

The following information has been compiled as a service to members. The contents came from various sources and our thanks must go to those who contributed. Information has been checked as correct at the time of compilation, but some errors will be inevitable. Should any individual, group or organisation have amendments or suggestions for further data editions these will be most welcome and should be addressed to: Data Information Update, WIA Executive Office, PO Box 300, Caulfield South Vic 3162. Only by this type of feedback can we hope to maintain an up-to-date and accurate data base.

Band plans for the Amateur Radio Service

1. The MF Band

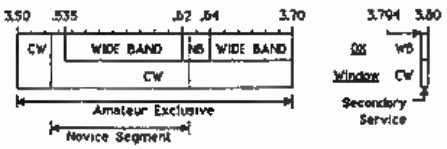
1.1 The 1.8 MHz Band (160 Metres)
1 800 - 1 875 MHz



1 870 +/- 4kHz
Avoid these frequencies

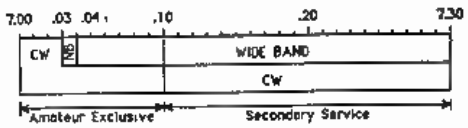
2. The HF Bands

2.1 The 3.5 MHz Band (80 Metres)
3 500 - 3 700 MHz and
3 794 - 3 800 MHz

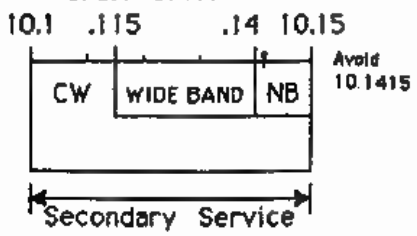


3 794 +1kHz
Avoid these frequencies

2.2 The 7 MHz Band (40 Metres)
7 00 - 7 300 MHz

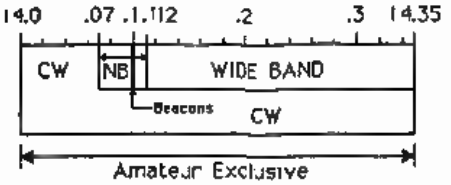


2.3 The 10MHz Band (30 Metres)
10.100 - 10.150 MHz



10.1415 +- 4 kHz
Avoid these frequencies

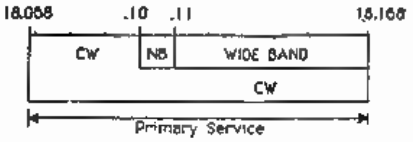
2.4 The 14 MHz Band (20 Metres)
14.000 - 14.350 MHz



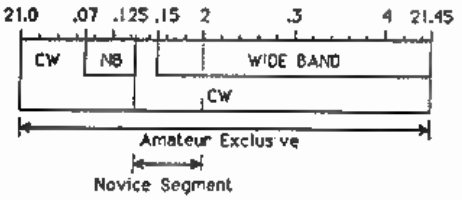
14 100 +/- 500 Hz	Beacon Guard Band
14.230	SSTV calling frequency
14 250	FAX calling frequency
14 095 - 14 112	Packet Radio (NB

Avoid beacons 14 100)

2.5 The 18 MHz Band (17 Metres)
18.068 - 18 168 MHz

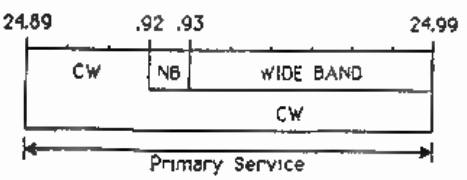


2.6 The 21 MHz Band (15 Metres)
21.00 - 21.450 MHz

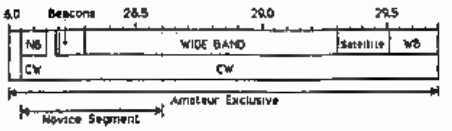


21 150 +- 500 MHz	IBP Beacon Guard Band
21 340 +- 5 kHz	SSTV

2.7 The 24 MHz Band (12 Metres)
24 890 - 24 990 MHz



2.8 The 28 MHz Band (10 Metres)
28 000 - 29 700 MHz

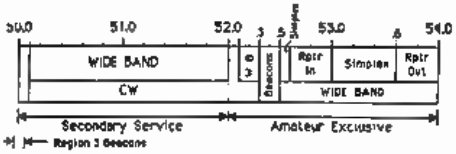


28.190 - 28.200	IBP Beacon Segment
28 200 - 28.300	Existing Beacons until 1 Jan 1990
28 680 +- 5 kHz	SSTV
29 300 - 29 510	Satellite Down Link
29 510 - 29 700	Wide Band (FM)
29 520 - 29.580	FM Repeater Inputs (Note 1)
29 600	FM Simplex
29 620 - 29 680	FM Repeater Outputs (Note 2)

Note: 1
Four repeater channels have been allocated, spaced at 20 kHz with 100 kHz offset.

3 The VHF Bands

3.1 The 50 MHz Band (6 metres)



50 000 - 52 000	Restricted use segment Note 1)
50 000 - 50.100	CW
50 000 - 50 010	EME
50 100 52 000	CW/Phone
50 110	DX Calling Frequency
52 000 - 52 010	EME
52 010 52 050	DX CW
52 025	CW calling frequency
52 050	MS calling frequency
52 050 - 52 100	DX CW/Phone
52 075	RTTY calling frequency
52.100	Phone calling frequency (primary
52 100 52 300	CW/Phone
52 200	Phone calling frequency (secondary)
52 300	SSTV calling frequency
52 300 52 400	Beacons – secondary (Note 3

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DICK SMITH ELECTRONICS

52.400 - 52.500	Beacons – primary (Note 3)
52.500 - 52.600	General all modes
52.525	International FM Calling
52.600 - 54.000	FM simplex and repeaters (Note 2)
52.600 - 52.975	Repeater inputs – allocated two/state
53.000 - 53.400	General all modes
53.400 - 53.575	Simplex frequencies
53.500	National FM calling
53.600 - 53.975	Repeater outputs

Notes:

1) DOC provided the conditions for use of 50-52 MHz in a revision to DOC71 as follows:

Amateur stations are permitted to operate within this band subject to the conditions set out below:

(i) No interference is caused to the reception of channel 0 transmissions;

ii) In New South Wales, Victoria, Queensland and Tasmania operation is restricted to:

(a) the sub-band 50.05 to 50 .20 MHz;

(b) locations outside the following minimum radial distances from:

Television channel 0 main stations 120 km

Television channel 0 translaters stations 60 km

Television translator stations with channel 0 inputs 60 km

(c) emission mode 200HA1A with a maximum transmitter power of 100 watts pY; and

(d) emission mode 4K00J3E with a maximum transmitter power of 100 watts pX.

(iii) In the Australian Capital Territory operation is restricted to:

(a) the sub-band 50.05 to 50.20 MHz;

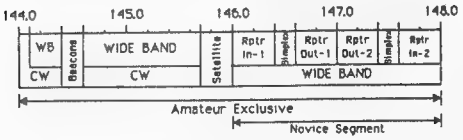
(b) emission mode 200HA1A with a maximum transmitter power of 100 watts pY; and

(c) emission mode 4K00J3E with a maximum transmitter power of 100 watts pX.

2) The repeater split is 1 MHz and channel spacing 25 kHz.

3) The beacon frequencies are allocated in accordance with the beacon plan on a state basis (ie VK1, 52.410; VK2, 52.420 MHz etc).

3.2 The 144 MHz Band (2 metres)
144.0 - 148.0 MHz



144.0 - 144.01	EME
144.01 - 144.05	DX CW
144.025	CW calling
144.050	MS calling
144.05 - 144.10	DX CW/Phone
144.075	RTTY calling frequency
144.10	Phone calling (primary)
144.20	Phone calling (secondary)
144.30	SSTV calling
144.40 - 144.50	Beacons-primary (Note 3)
144.50 - 144.60	Beacons-secondary (Note 3)
144.800 - 144.900	Data Transmission
144.925 - 144.975	CW Beacons
145.700 - 146.000	Satellite Segment
146.450	Primary voice
146.500	National calling (primary)
146.600	RTTY
147.300	ATV Liaison
147.325	RTTY
147.350	RTTY
147.400	ATV Liaison
147.425	ATV Liaison
147.450	ATV/SSTV/FAX
147.475	SSTV/FAX Liaison
147.500	National calling (secondary)
147.550	Micro nets
147.575	Data nets
147.600	Data packet

Notes:

1) FM channels spacing is 25 kHz and repeater offset is 600 kHz.

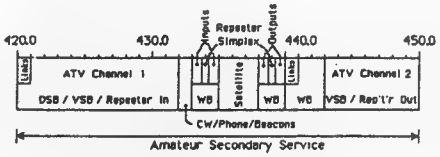
Note 2:

2) FM channel numbers designated by last four digits of (repeater output) frequency.

3) The beacon frequencies are allocated in accordance with the beacon plan on a state basis.

4 The UHF Bands

The 420 MHz Band (70 centimetres)



420.0 - 450.0 MHz	
420.00 - 432.00	ATV channel, 1 DSB/ VSB
426.25	Vision
431.75	Sound
420.05 - 421.00	Repeater linking - A pairs (Note 4)
432.00 - 432.01	DX EME
432.01 - 432.025	DX CW
432.025	Calling frequency
432.025 - 432.050	DX MS
432.050	Calling frequency
432.050 - 432.075	DX RTTY
432.075	Calling frequency
432.075 - 432.100	DX Phone
432.100	Calling frequency (primary)
432.100 - 432.200	Phone
432.200	Calling frequency (secondary
432.200 - 432.300	SSTV
432.300	Calling frequency
432.300 - 432.400	CW/Phone
432.400 - 432.600	Beacons (Note 5)
432.600 - 433.000	General all modes
433.025 - 434.975	FM repeater inputs & simplex
433.025 - 433.725	FM repeater inputs
433.750 - 434.250	Simplex
434.275 - 434.975	FM repeater inputs
435.000 - 438.000	Satellites
438.025 - 439.975	FM repeater outputs & simplex
438.025 - 438.725	FM repeater
438.025	Mobile voice
438.075	Mobile voice (secondary)
438.125	RTTY
438.175	Mobile voice
438.225	Mobile voice (secondary)
438.275	WICEN portable
438.325	Mobile voice
438.375	Mobile voice (secondary)
438.425	Mobile voice
438.475	Mobile voice
438.525	Mobile voice (national primary)
438.575	Data
438.625	WICEN portable
438.675	Mobile voice (secondary)
438.725	RTTY
438.750 - 439.250	FM simplex
438.775	RTTY
438.800	WICEN
438.825	Voice (secondary)
438.875	Data
438.925	SSTV
439.000	Voice (national primary)
439.050 - 439.075	Data packet
439.125	Voice secondary
438.275 - 439.975	FM repeater outputs
439.275	Mobile voice
439.325	RTTY
439.425	Mobile voice
439.475	RTTY
439.575	Mobile voice
439.725	Mobile voice
439.875	Mobile voice
439.975	SSTV
440.050 - 441.000	Repeater linking -B pairs (Note 4)
440.000 - 443.000	Experimental- all modes
443.000 - 450.000	ATV channel 2 VSB
444.25	Vision carrier
449.75	Sound carrier

Notes:

1) FM channel spacing is 25 kHz and repeater offset is 4 MHz.

2) FM channel numbers designated by last four digits of (repeater output frequency).

3) FM channels with no specific recommended use may be used for any purpose.

4) A pair of frequencies are to be used repeater linking. Maximum power for inter repeater linking is 5 watts.

5) The beacon frequencies are allocated in accordance with the beacon plan on a state basis.

4.2 The 576 MHz Band (50 centimetres)
576.0 - 585.0 MHz

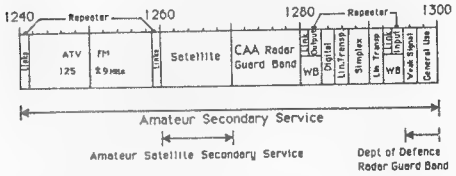
Only existing ATV repeaters will be permitted in this band

578.00 - 585.00 ATV, VSB or repeater output

579.25 Vision carrier

584.75 Sound carrier

4.3 The 1240 MHz Band (23 centimetres)
1240.0 - 1300.0 MHz



Frequency (MHz)	Details
1240.00 - 1241.00	FM Relays and Links (Note 3)
1241.00 - 1259.00	ATV Channel
1259.00 - 1260.00	FM Relays and Links (Note 3)
1260.00 - 1270.00	Satellite Communication (WARC 1979)
1270.00 - 1280.00	General use except in areas where these frequencies are in use for Radio Location (Note 4)
1280.00 - 1281.00	FM Relays and Links (Note 3)
1281.05 - 1283.00	FM Repeater outputs
1281.05	RTTY
1281.10	Mobile voice
1281.15	RTTY
1281.20	Mobile voice
1281.25	Data
1281.30	Mobile voice
1281.35	Data
1281.40	Mobile voice (secondary)
1281.45	
1281.50	Mobile voice (primary)
1281.60	Mobile voice (secondary)
1281.65	Mobile voice
1281.70	Mobile voice
1281.80	Mobile voice
1281.85	ATV Liaison
1281.90	Mobile voice
1281.95	ATV Liaison
1282.00	Mobile voice
1282.10	Mobile voice
1282.15	RTTY
1282.20	Mobile voice
1282.25	RTTY
1282.30	Mobile voice
1282.35	Data
1282.40	Mobile voice
1282.45	Data
1282.50	Mobile voice
1282.60	Mobile voice
1282.70	Mobile voice
1282.80	Mobile voice
1282.90	Mobile voice
1283.00	Mobile voice
1283.00 - 1285.00	Digital and Packet Radio
1285.00 - 1287.00	In-band Linear Transponder
1287.00 - 1290.00	General use FM Simplex
1288.50	National FM Simplex Calling Frequency
1290.00 - 1292.00	In-Band and Cross Band Linear Transponder
1292.00 - 1293.00	FM Relays and Links (Note 3)
1293.00 - 1295.00	FM Repeater inputs
1295.00 - 1297.00	Weak signal modes, except in areas where these frequencies are in use for Radio Location (Note 4)
1296.40 - 1296.59	Beacons (Note 5)
1297.00 - 1300.00	General use except in areas where these frequencies are in use for Radio Location (Note 4)

Notes:

1) FM channel spacing is 25 KHz and repeater offset is 12 MHz.

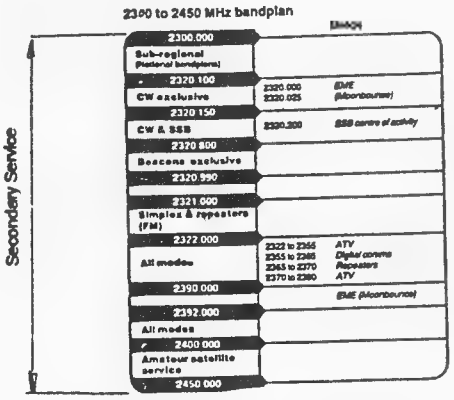
2) FM channels with no specific recommended use may be used for any purpose.

3) A pair of frequencies are to be used for repeater linking. Maximum power for inter-repeater linking is 5 watts.

4) In Australia, some Department of Aviation RADAR's are centered on 1275.0 MHz and 1305.0 MHz, while some Department of Defence RADAR's are centered on 1300.0 MHz. Accordingly the frequencies 1270.0 to 1280.0 MHz and 1295.0 to 1300.0 MHz are allocated as a guard band to ensure no harmful interference is caused to the primary user.

5) The beacon frequencies are allocated in accordance with the beacon plan on a state basis.

4.4 The 2300 MHz Band (13 centimetres)
2300.0 - 2450.0 MHz



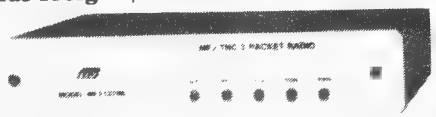
2300.000 - 2320.100 MHz	General use
2320.100 - 2320.150	CW
2320.000	EME (moon-bounce)
2320.025	EME (moon-bounce)
2320.150 - 2320.800	CW & SSB
2320.800 - 2320.990	Beacons
2320.990 - 2321.000	General use
2321.000 - 2322.000	Simplex & repeaters FM
2322.000 - 2390.000	All modes
2322 - 2355	ATV
2355 - 2365	Digital comms
2365 - 2370	Repeaters
2370 - 2390	ATV
2390.000 - 2392.000	EME (moon-bounce)
2392.000 - 2400.000	All modes

MFJ VHF/HF PACKET RADIO CONTROLLERS

Now with:

- ***Easy Mail***
- ***WeFax***
- ***KISS***
- ***32K RAM***

With the MFJ1270B You get more features than any other packet control ler — the new Easy Mail Personal Mailbox, HF/VHF Modems, WeFAX reception, KIS, and a one year unconditional guarantee and more for only $299 including sales tax Plus Freight $12 with-in Australia



You can double your fun by operating both VHF *and* HF packet because you get **high performance** switchable VHF/HF modems.

You get the **Easy Mail**™ Personal Mailbox with soft-partitioned memory so you and your ham buddies can leave messages for each other 24 hours a day.

In MFJ's new WeFAX mode you can print full fledged weather maps to screen or printer and save to disk using an IBM compatible or Macintosh computer with an MFJ Starter Pack.

A new **KISS** interface lets you run **TCP/IP.** They also come **NET ROM** compatible -- *no modification needed!*

You also get 32K RAM, a one-year *unconditional* guarantee and you can use 12 VDC or the included 110 VAC power supply.

For dependable HF packet tuning, the **MFJ-1274** gives you a high resolution tuning indicator that's accurate to within 10 Hz -- and it's only **$50.00 more**

HOW TO ORDER

MFJ1270B TNC Controller $299.00
MFJ1274 TNC Controller with tuning indicator built in $349.00

MFJ STARTER PACKS

Include interface cable, software on disc and complete instruction ... everything you need ... order as listed below

MFJ1284 for IBM or compatibles $24.95
MFJ1282 for C64/128/VIC 20 $24.95
MFJ1278 for Macintosh $24.95

STEWART ELECTRONICS

44 Stafford St Huntingdale 3166
P.O.Box 281 Oakleigh 3166
Phone (03) 543-3733 Fax (03) 543 7238
BankCard, Visa, Master Card Welcome

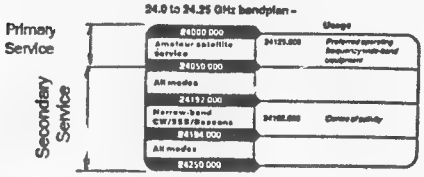
2400.000 - 2450.000	Satelliters

5 The SHF Bands

5.1 The 3300 MHz Band (10 centimetres)
3300.0 - 3600.0 MHz

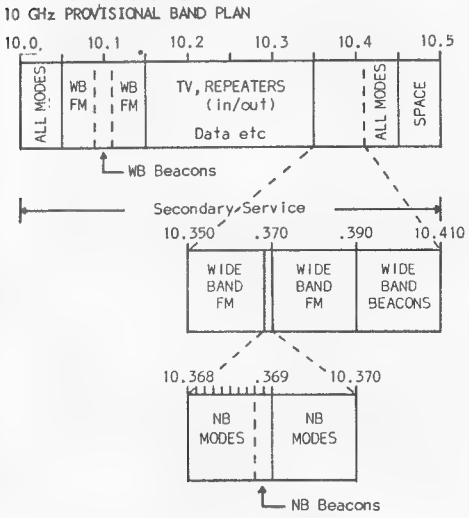
3300.000 - 3456.000 MHz	All modes
3400.000 - 3410.000	Satellites
3456.000 - 3458.000	Narrow band, CW/EME/ SSB
3456.250	Centre of activity
3458.000 - 3600.000	All modes

5.2 The 5650 MHz Band (5 centimetres)
5650.0 - 5850.0 MHz



5650.000 - 5670.000MHz	Satellite uplink
5670.000 - 5760.000	All modes
5760.000 - 5762.000	Narrow band CW/EME/ SSB
5760.250	Centre of activity
5762.000 - 5830.000	All modes
5830.000 - 5850.000	Satellite down link

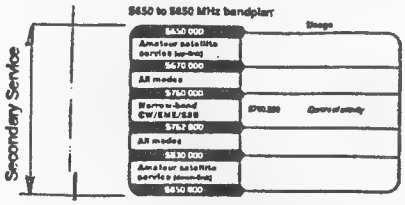
5.3 The 10 GHz Band (3 centimetres)
10.0 - 10.5 GHz



10.00 - 10.05GHz	All modes
10.05 - 10.15	Wide Band FM
10.10 - +/-	Wide Band Beacons
10.15 - 10.35	TV, Repeaters (in/out), data etc.
10.150	Packet (1 MHz BW)
10.35 - 10.41	Wide Band Modes
10.39 - 10.41	Wide Band Beacons
10.368 - 10.370	Narrow Band Modes
10.368 - 10.3684	Narrow Band Beacons
10.41 - 10.45	All modes
10.45 - 10.50	Space - Satellite Comms

Based upon UK band plan as notified to IARU Region - 1

5.4 The 24GHz Band Plan (1 centimetre)
24.00 - 24.25GHz



24.000 - 24.050 GHz	Satellites
24.050 - 24.192	All Modes
24.125	Preferred wide band frequency
24.192 - 24.194	Narrow band CW/SSB/Beacons
24.192	Centre of activity
24.194 - 24.250	All modes

5.5 The 47 GHz Band Plan (6 Millimetre)
47.00 - 47.20 GHz

47.000 - 47.2000 GHz	All modes
47.088	Centre of narrow band activity

No band plans have been prepared for the remaining microwave bands.

5.6 75.5 - 81.0 GHz (4 Millimetre)

Service	Band (GHz)	Status
Amateur	75.5 - 76	Primary
Amateur Satellite	75.5 - 76	Primary
Radio Location	76 - 81	Primary
Amateur	76 - 81	Secondary
Amateur Satellite	76 - 81	Secondary

5.7 142 - 149 GHz (2 Millimetre)

Service	Band (GHZ)	Status
Amateur	142 - 144	Primary
Amateur Satellite	142 - 144	Primary
Radio Location	144 - 149	Primary
Amateur	144 - 149	Secondary
Amateur Satellite	144 - 149	Secondary

5.8 241 - 250 GHz (1 Millimetre)

Service	Band (GHz)	Status
Radio Location	241 - 248	Primary
Amateur	241 - 248	Secondary
Amateur Satellite	241 - 248	Secondary
Amateur	248 - 250	Primary
Amateur Satellite	248 - 250	Primary

CALL SIGN SUFFIXES

Amateur station call signs normally commence with the letters "VK" followed by a numerical State identifier (ie: 1/2/3/4/5/6/7/8/9/ or 0). However, to commemorate special events, the use of "VI" or "AX" may be authorised on a temporary basis.

The alphanumeric series outlines is suffixed with up to three letters which indicate the class of amateur licence held and the individual identity of the station. Call sign suffixes are allocated according to the following table:

Two Letter Suffixes:

All two-letter suffixes except "AA" and "WI" indicate a full call licensee.AA = Official DOTC call sign.WI = Allocated to the Wireless Institute of Australia

Three Letter Suffixes:

AAA-AZZ	=	Full call licensees
BAA-BZZ	=	Full call licensees
CAA-CXX	=	Full call licensees
DAA-DZZ	=	Full call licensees
EAA-EZZ	=	Full call licensees
FAA-FZZ	=	Full call licensees
GAA-GZZ	=	Full call licensees
(Note: GGA-GGZ - Girl GuildesAssociation)		allocated to the
HAA-HZZ	=	Not allocated
IAA-IZZ	=	Not allocated
JAA-JZZ	=	Combined licensees
KAA-KZZ	=	Combined licensees
LAA-LZZ	=	Novice licensees
MAA-MZZ	=	Novice licensees
NAA-NZZ	=	Novice Licensees
OAA-OZZ	=	Not allocated
PAA-PZZ	=	Novice licensees
QAA-QZZ	+	Not allocated, can be confused with Q codes
RAA-RZZ	=	Beacons and repeaters
SAA-SZZ	=	Full call licensees
(Note: SAA-SDZ - Scout Association)		allocated to the
TAA-TZZ	=	Limited licensees
UAA-UZZ	=	Limited licensees
VAA-VZZ	=	Novice licensees
WAA-WZZ	=	Full call licensees
(Note: WIA-WIZ allocated to the WIA)		
XAA-XZZ	=	Limited licensees
YAA-YZZ	=	Limited licensees
ZAA-ZZZ	=	Limited licensees

Note: Certain "non-standard" suffixes are allocated including: RAN, GGx, TTx,ITU,BSx, SJx, etc.

14 MHz Beacons

This series is sponsored by the Northern Californian DX Foun-dation. The beacons all operate in turn on the one frequency of14.100 MHz. The series starts on the hour. They send the fol-lowing series of signals at the powers indicated:

QST de (callsign) 100W
._ 100W
.._ 10W
..._ 1W
...._ 0.1W
sk de (call) 100W

The call sequence is as follows:

T+0 min	4UIUN/B	New York
T+1	W6WX/B	Stanford
T+2	KH60/B	Honolulu
T+3	JA21GY	Ise City
T+4	4X6YU/B	Tel Aviv
T+5	OH2B	Espoo
T+6	CT3B	Funchal
T+7	ZS6DN/B	Pretoria
T+8	LU4AA	Santa Cruz
T+9	HK4LR/B	Colombia

VK Aeronautical Beacons useful for Propagation Tests

VK1	Canberra	NDB	263	kHz	CB
		VOR	116.7	MHz	
VK2	Sydney	NDB	317	kHz	SY
		VOR	115.4	MHz	
	Lord H. Is	NDB	272	kHz	LHI
VK3	Melb	NDB	356	Khz	EN
		VOR	114.1	MHz	ML
VK4	Brisbane	NDB	302	kHz	BN
		VOR	113.2	MHZ	
	Cairns	NDB	364	kHz	
VK5	Adelaide	NDB	362	kHz	AD
		VOR	116.4	MHz	
VK6	Perth	NDB	400	kHz	PH
		VOR	113.7	MHz	
	Pt Hedland	NOB	260	kHz	PD
		VOR	114.1	MHz	
VK7	St Helens	NDB	392	kHz	STH
	Strahan	NDB	257	kHz	SRN
	Hobart	VOR	112.7	MHz	HB
VK8	Alice Sps.	NDB	335	kHz	AS
		VOR	115.9	MHz	
	Darwin	NDB	344	kHz	DN
		VOR	112..4	MHz	
VK9	Cocos Is.	NDB	305	kHz	CC
	Norfold Is.	NDB	260	kHz	NF
	Christmas Is.	NDB	341	kHz	XMX

ZL Aeronautical Radio beacons

Station	Call-Sign	Freq. kHz
Ashburton	AS	254
Chatham Is.*	CI	322
Christchurch	CH	274
Dunedin	DN	338
Gisborne	GS	346
Hokitika	HK	310
Kaikoue	KI	326
Kaitaia	KT	238
Napier	NR	354
Nelson	NS	394
New Plymouth	NP	370
Oamaru	OU	302
Tauranga	TG	266
Wairoa	WO	246
Waiuku	WI	254
Wanganui	WU	382
Waverley	WY	330
Wellington	WN	298
Westpoint	OT	398
Westport	WS	278
Whakatane	WK	362
Whangarei	WR	386
Whenuapai	WP	206
Wigram	WG	406
Woodend	OD	262

*No 24-hour service. Operated only on request throughChatham Island Radio ZLC.

Emergency

First aid in case of shock Ref. P.120 (last page) 1990 Call book.
All emergency services, all states, Dial 000.
Federal Sea Safety and Surveillance Centre (062) 47 6666/47 5244
Natural Disasters Organisation (062) 46 6600
(charges can be reversed)

Standard Frequency Transmissions

Station	Frequencies (MHz)	Location
WWV	2.5,5,10,15,20	Colorado, USA.
WWVH	2.5,5,10,15.	Hawaii, USA
VNG	5,10,15.	Llandilo, NSW.
Omega	13kHz	Darriman, Vic.
NPN	21.76, 17.53, 13.38, 8.15, 4.955.	Guam
NPM	22.593, 16.457, 13.655, 9.05, 4.525. 131.05 kHz	Hawaii, USA.
ZLW/ZMO	417.5 kHz	Wellington, NZ.

Wireless Institute Civil Emergency Network (WICEN)

Primary	Secondary Frequencies
3.600 MHz	(+25 kHz SSB
7.075	-25 kHz CW)
14.125	
21.190	
28.450	

Wicen Nets

VK1	None		
VK2	THU	1100Z	7150 repeater
VK3	SUN	1030Z	3.600 MHz
VK4	SUN	2230Z	7.075 MHz
(as required Brisbane Stormwatch 7000 repeater)			
VK5	WED	1000Z	(+30 summer-time) 7000 Repeater
		1000Z	(+1h summer-time) 3.600 MHz
VK6	WED	1200z	3.600 Mhz
VK7	None		
VK8	Refer VK5.		

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10 METRE BEACONS

Freq.	Call	Operation	Location	Notes
28.050	PY2GOB		Sao Paulo, Brazil	15W, vertical.
28.175	VE3TEN	C	Ottawa, Ontario, Canada	10W, ground plane
28.195	1Y4M		Bologna, Italy	20W,5/8 ground plane
28.200	GB3SX	C	Crowborough, UK	8W, dipole
28.200	KF4MS	C	St Petersburg, Florida, USA	75W, ground plane
28.201	LU8ED		Buenos Aires, Argentina	5W
28.2025	ZS5VHF		Durban, Rep of South Africa	15W, ground plane
28.205	DLIIGI	C	Mt Predigtstuhl, West Germany	100W, vertical dipole
28.207	W8FKL	C	Venice, Florida, USA	10W, vertical
28.208	WA110B	C	Marlborough, Massachusetts, US	75W, vertical
28.210	3B8MS	C	Mauritius	ground plane
28.210	K4KMZ	I	Elizabethtown, Kentucky, USA	20W, vertical
28.212	EA6RCM		Palma de Mallorca, Spain	4W, 5el NNE
28.2125	ZD9Gi	C	Gough Is South Atlantic	ground plane
28.215	GB3RAL	C	Slough, Berkshire, UK	20W, ground plane
28.215	LU4XI		Puerto Deseado, Argentina	
28,220	5B4CY	C	Zyyi, Cyprus	26W, ground plane
28.222	W9UXO	C	Lake Bluff, Illinois, USA	10W, ground plane
28.2225	HG2BHA	C	Tapolca, Hungary	10W, ground plane
28.2275	EA6AU	C	Mallorca, Balearic Is, Spain	10W 5/8 ground plane
28.230	ZL2MHF	C	Mt Climie, New Zealand	1W, vertical dipole
28.231	N4LMZ	C	Mobile, Alabama, USA	2W, 5/8 ground plane
28.232	W7JPI/AZ	C	Sonoita, Arizona, USA	5W, 3el Yagi NE
28.233	KD4EC	C	Jupiter, Florida, USA	7W, ground plane
28.235	VP9BA	C	Hamilton, Bermuda	10W, ground plane
28.2375	LA5TEN	C	Oslo, Norway	10W, 5/8 ground plane
28.240	OA4CK	C	Lima, Peru	10W
28.2405	5Z4ERR	C	Kiambu, Kenya	
28.2425	ZS1CTB	C	Capetown, Rep of South Africa	20W, 1/4 vertical
28.245	A92C		Bahrain	dipole, NW/SE
28.247	EA3JA		Barcelona, Spain	
28.2475	EA2HB	I	San Sebastian, Spain	6W, ground plane
28.248	K1BZ	C	Belfast, Maine, USA	5W, vertical dipole
28.250	Z21ANB	C	Bulawayo, Zimbabwe	15W, ground plane
28.250	4N3ZHK		Yugoslavia	1W, vertical
28.252	WB4JHS	I	Durham, North Carolina, USA	7W, vertical
28.254	KB2EAR	I	Kendall Park, New Jersey, USA	
28.255	LU1UG		Gral Pico, Argentina	5W, ground plane
28.2575	DK0TEN	C	Konstanz, West Germany	40W, ground plane
28.260	VK5WI	C	Adelaide, SA, Australia	10W,ground plane
28.262	VK2RSY	C	Sydney, NSW, Australia	25W, ground plane
28.264	VK6RWA	C	Perth, WA, Australia	
28.266	VK6RTW	C	Albany, WA, Australia	
28.266	KB4UPI	C	Birmingham, Alabama, USA	50W, 1/4 vertical
28.2685	W9KFO	I	Eaton, Indiana, USA	0.75W, vertical
28.270	ZS6PW	C	Pretoria, Rep of South Africa	10W, 3el Yagi on G-land
28.270	VK4RTL	C	Townsville, QLD, Australia	
28.2725	9L1FTN	I	Freetown, Sierra Leone	10W, vertical dipole
28.275	AL7GQ	C	Jackson, Mississippi, USA	0.5/1W, broadside loop
28.2755	N6RDX	I	Stockton, California, USA	20W, 3el Yagi
28.2775	DF0AAB	C	Kiel, West Germany	15W, ground plane
28.280	YV5AYV		Caracas, Venezuela	10W, rotary beam on Europe
28.280	LU8EB		Buenos Aires, Argentina	5W
28.282	VE1MUF	C	Fredrickton, NB, Canada	0.5W, dipole
28.284	VP8ADE	C	Adelaide Is, Antarctica	8W, vertical beam to G-land
28.286	KA1YE		Rochester, New York, USA	2W, vertical dipole
28.287	W8OMV		Asheville, North Carolina, USA	5W, ground plane
28.287	H44SI	C	Honiara, Solomon Is	15W, ground plane
28.288	W2NZH	I	Moorestown, New Jersey, USA	5W, ground plane
28.290	VS6TEN	C	Mt. Matilda, Hong Kong	10W, vertical
28.292	ZD8HF		Ascension Island	
28.2925	LU2FFV		San Jorge, Argentina	5W, ground plane
28.295	WB8UPN	I	Cincinnati, Ohio, USA	10W, vertical
l28.296	W3VD	C	Laurel, Maryland, USA	1.5W, vertical dipole
28.297	WA4DJS	I	Ft Lauderdale, Florida, USA	10W, 76 meter longwire
28/300	PY2AMI	C	Sao Paulo, Brazil	10W, vertical dipole
28.301	ZS1LA	C	Stillbay, Rep of South Africa	20W, 3el Yagi NW
28.315	ZS6DN	C	Irene, Rep of South Africa	100W, vertical
28.888	W6IRT		North Hollywood, California, USA	5W, ground plane, code -practice
28.992	DLOANN		Nuernberg, West Germany	1W, delta loop

6 METRE BEACONS

Frequency	Callsign	Location	LOC	ERPW	Mode	Source	Date
50.000	G3BUX	Sheffield	-	-	-	Rad Com	12/88
50.004	PY1RO	Rio De Janeiro	-	-	-	AR	12/88
50.005	H44HIR	Honiara	Q190	10	-	AR	12/88
50.005	ZS2SIX	Port Elizabeth	KF25	10	A1A	AR	2/89
50.011	JA2IGY	Mie	PM84	-	-	AR	2/89
50.015	PJ4B	-	FK52TF	-	-	ZL2KT	21/3/89
50.015	SZ2DH	Athens	KM18	-	-	AR	2/89
50.017	JE6ZIH	Miyazaki	PM51RU	-	-	ZL3AAU	2/4/89
50.020	GB3SIX	Anglesey	IO73TJ	100	FIA	AR	12/88
50.020	JA6ZIH	Japan	PM51	-	-	AR	2/89
50.024	ZS6LW	Pretoria	-	-	-	Rad Com	10/88*
50.025	6Y5RC	Kingston	FK17	40	FIA	AR	12/88
50.028	JA7ZMA	Fukushima City	QM07	-	-	AR	2/89
50.030	CT0WW	Portugal	IN61	-	-	AR	2/89
50.033	ZD8VHF	Ascension Is	II22TB	50	-	AR	1/89
50.035	H1JX	-	-	-	-	AR	12/88
50.035	ZB2VHF	Gibraltar	IM76HE	100	AIA	AR/R Com	12/88
50.038	FY7THF	French Guina	GJ35	-	-	AR	2/89
50.0425	GB3MCB	St Austell	1O70	-	-	Rad Com	11/88
50.045	OX3VHF	Greenland	GP60QQ	20	A1A	AR	12/88
50.048	VE6ARC	-	-	-	-	AR	12/88
50.050	GB3NHQ	Potters Bar	1091VQ	15	FIA	AR	12/88
50.0575	TF3SIX	Iceland	HP94	-	-	AR	2/89
50.060	W1XJ/B	-	-	-	-	ZL3AAU	25/3/89
50.060	ZS6DN/B	Pretoria	KG44	100	-	AR	2/89
50.062	PY2AA	Sao Paulo	GG66	25	A1A	AR	2/89
50.0625	GB3NGI	-	-	-	-	Rad Com	11/88*
50.064	WD7Z	Arizona	EL59	-	-	AR	2/89
50.065	GJ4HXJ	England	IN89	-	-	AR	2/89
50.065	NB30/1	Rhode Is	FN41	-	-	AR	2/89
50.065	WD7X/B	New Mexico	DM75	-	-	ZL3AAU	12/3/89
50,066	VK6RPH	Perth	OF78	-	-	AR	12/88
50.067	WA6IJZ	-	-	-	-	AR	12/88
50.068	K6FVXB	-	CM88	-	-	ZL3AAU	2/3/89
50.074	ZS4SA	Deneysville	-	-	-	Rad Com	10/88*
50.075	VS6SIX	Hong Kong	OL72	30	-	AR	1/89
50.075	ZS5SIX	-	-	-	-	Rad Com	11/88*
50.078	T12NA	Costa Rica	EK70	-	-	AR	2/89
50.080	HC8SIX	Galapagos Is	E159	-	-	AR	2/89
50.080	KH6JJK	Hawaii	BL11	-	-	AR	2/89
50.085	9H1SIX	Malta	JM75FV	-	-	RC 6/87 AR	12/88
50.086	VP2MO	Montserrat	FK8	-	-	AR	2/89
50.088	VE1SIX	New Brunswick	FN65	-	-	AR	2/89
50.089	WA6JRA	-	-	-	-	AR	12/88
50.090	KJ6BZ	Johnston Is	AK56	-	-	AR	2/89
50.090	ZF2KZ	Cayman Is	EK99	-	-	AR	12/88
50.092	W5GTP	Louisiana	EM40	-	-	AR	2/89
50.099	KP4EKG	Puerto Rico	FK68	-	-	AR	2/89
50.099	VP5D	-	FL**	-	-	ZL3AAU	7/4/89
50.100	HC2FG	Ecuador	F107	-	-	AR	2/89
50.100	KG6DX	Guam	QK23KL	-	-	AR	12/88
50.100	ZS3E	-	JG87	-	-	ZL2BGJ	26/2/89
50.110	A61XL	U Arab Emir	LL74	-	-	AR	2/89
50.110	BY4AA	China	-	-	-	AR	12/88
50.120	4S7EA	Sri Lanka	MJ97	-	-	AR	2/89
50.321	ZS5SIX	South Africa	KG50	-	-	AR	2/89
50.490	JG1ZGW	Tokyo	PM95	-	-	AR	12/88
50.499	5B4CY	Zyyi	KM54PS	-	-	AR	2/89
50.500	FK8KAB	-	-	-	-	AR	12/88
50.904	ZS1SIX	-	-	-	-	Rad Com	11/88
			**********				
51.020	ZL1UHF	Nihotupu	-	25	F1	AR	2/89*
51.030	ZL2MHB	Napier	RF80	10	F2	AR	2/89*
51.225	ZL2VHT	Inglewood	RF70	30	F2	NZART Call Bk	88+
			**********				
52.013	P29BPL	Port Moresby	-	-	-	AR	12/88
52.100	ZK2SIX	Niue	AH50	-	-	AR	12/88
52.150	VK0CK	Macquarie Is					
52.200	VK8VF	Darwin	PH57	15	-	AR	12/88
52.250	ZL2VHM	Pahiatua Track	RE79	8	F1	NZART Call Bk	88 +
52.310	ZL3MHF	Aylesbury	RE66	-	-	NZART Call Bk	88
52.320	VK6RTT	Wickham	OG89	-	-	AR	2/89
52.325	VK2RHV	Newcastle	QF57	-	-	AR	2/89
52.330	VK3RGG	Geelong	QF21	-	-	AR	2/89
52.345	VK4ABP	Longreach	QG26	-	-	AR	2/8

952.350	VK6RTU	Kalgoorlie, WA					
52.370	VK7RST	Hobart	QE37	-	-	AR	12/88
52.410	VK1RCC	Mt Majura					
52.418	VK0MA	Mawson					
52.420	VR2RSY	Sydney	QF56	-	-	AR	12/88
52.425	VK2RGB	Gunnedah	QF59	-	-	AR	12/88
52.435	VK3RMV	Hamilton	QF12	-	-	AR	2/89
52.440	VK4RTL	Townsville	QH30	-	-	AR	2/89
52.445	VK4RIK	Cairns	QH23	-	-	AR	2/89
52.450	VK5VF	Mount Lofty	PF95	-	-	AR	2/89
52.460	VK6RPH	Perth	OF78	-	-	AR	2/89
52.465	VK6RTW	Albany	OF84	-	-	AR	2/89
52.470	VK7RNT	Launceston	QE38	-	-	AR	2/89
52.485	VK8RAS	Alice Springs	PG66	-	-	AR	2/89
52.490	ZL2SIX	Blenheim	RE68	10	F1	NZART Call Bk	88+
52.510	ZL2MHF	Mt Climie	RE78BU	4	E1	NZART Call Bk	88

*Not Operational +Status Unknown'Source' call signs indicate beacons heard in ZL

DUPLEX REPEATER LIST FEBRUARY 1990

OUT PUT TXFREQ	INPUT RXFREQ	SITE		COVERAGE
146.9000	146.3000	Black Hill	VK1RAC	Canberra
146.9500	146.3500	Mt Ginini	VK1RGI	S.E. NSW
438.3750	433.3750	Isaacs Ridge North	VK1RIR	Canberra
438.5250	433.5250	Mt Ginini	VK1RGI	S.E. NSW
29.6200	29.5200		VK2RAH	Wollongong
53.625	52.625	Sugarloaf Range	VK2RSN	Newcastle
53.8500	52.8500	Dural	VK2RWI	Sydney
146.6250	146.0250	Byron Bay	VK2RBB	Byron Bay
146.6250	146.0250	Razorback	VK2RLD	Sydney
146.6500	146.0500	Mt. Coramba	VK2RCH	Coff's Harbour
146.6500	146.0500	Mt. Bindo	VK2RDX	Oberon
146.6500	146.0500	Terry Hie Hie	VK2RMI	Moree/Inverell
146.6750	146.0750	Blacktown (RTTY)	VK2RTY	Sydney
146.7000	146.1000	Mt Canobolas	VK2RAO	Orange
146.7000	146.1000	Milton	VK2RMU	Ulladulla
146.7000	146.1000	Middle Brother	VK2RPM	Taree
146.7250	146.1250	Somersby	VK2RAG	Gosford
146.7500	146.1500	Mumbulla Mt.	VK2RFS	Bega
146.7500	146.1500	Mt Gilbraltar	VK2RHR	Sth. Highlands
146.7500	146.1500	Mt Crawney	VK2RTM	Tamworth
146.7500	146.1500	Mt Flackney	VK2RWG	Wagga Wagga
146.7750	146.1750	Sugarloaf Range	VK2RTZ	Newcastle
146.8000	146.2000	Needle Mtn	VK2RCC	Coonabarabran
146.8000	146.2000	Goonellabah	VK2RIC	Lismore/Casino
146.8000	146.2000	Heathcote	VK2RLE	Sydney
146.8000	146.2000	Kendell Trig	VK2RTD	Tumut
146.8250	146.2250	Bundook Mountain	VK2RET	
146.8500	146.2500	Mt Kaputar	VK2RAB	Gunnedah
146.8500	146.2500	Mt Murray	VK2RAW	Wollongong
146.8500	146.2500	Mt Bingar	VK2RGF	Griffith
146.8750	146.2750	Terrey Hills	VK2RMB	Sydney
146.9000	146.3000	Mt Sugarloaf	VK2RAN	Lwr. Hunter
146.9000	146.3000	Boona Mount	VK2RRT	Condoblin
146.9250	146.3250	North Ryde	VK2RGR	Sydney
146.9500	146.3500	Glenn Innes	VK2RNE	Glen Innes
146.9750	146.3750	Mt Sugarloaf (RTTY)	VK2RAN	Newcastle
147.0000	146.4000	Dural	VK2RWI	Sydney
147.0250	147.6250	Paddington	VK2ROT	Sydney
147.0500	147.6500	Mount Druitt	VK2RBM	Nepean/Blue Mts
147.1000	147.7000	Grenfell	VK2RWM	Grenfell
147.1000	147.7000	Mt Arthur	VK2RZL	Upper Hunter
147.1500	147.7500	Chatswood	VK2RWS	Sydney
147.2000	147.8000	Mt Cambewarra	VK2RSD	Nowra
147.2250	147.8250	Lane Cove	VK2RST	Sydney
147.2500	147.8500	Asquith	VK2RNS	Sydney
147.2750	147.8750	Sublime Point (R/V)	VK2RIL	Woolongong
147.3000	147.9000	Springwood	VK2RTS	Lwr Blue Mts
147.3750	147.9750	Cabbage Tree Mtn	VK2RGL	
147.9250	147.3250	Mt Gray	VK2RGN	Goulburn
438.0750	433.0750	Somersby	VK2RAG	Gosford
438.1750	433.1750	Terrey Hills	VK2RMB	Sydney
438.1750	433.1750	Doughboy Mountain	VK2RNT	Armidale
438.2250	433.2250	Port Kembla	VK2RUW	Wollongong
438.2750	433.2750	Chatswood	VK2RWS	Sydney
438.3250	433.3250	Mt Marie	VK2REE	Taree
438.3250	433.3250	Grenfell	VK2RWM	Grenfell
438.3750	433.3750	Kurrajong Heights	VK2RUT	Kurrajong
438.4250	433.4250	Hurstville	VK2RUH	Sydney
438.4750	433.4750	Chatswood	VK2RRS	Sydney
438.5250	433.5250	Middle Brother	VK2RPM	Pt. Macquarie
438.5250	433.5250	Dural	VK2RWI	Sydney
438.6250	433.6250	Merewether	VK2RUM	Newcastle
438.6750	433.6750	Mt Sugarloaf	VK2RAN	Newcastle
438.6750	433.6750	Nightcap Range	VK2RSC	Lismore/Casino
438.6750	433.6750	Willans Hill	VK2RTW	Wagga Wagga
438.7250	433.7250	Sublime Point	VK2RIL	Woolongong
1281.7500	1293.7500	Dural	VK2RWI	Sydney
29.6400	29.5400		VK3RHF	Melbourne
53.5500	52.5500	Wattle Glen	VK3RMH	Melbourne
53.5750	52.5750	Dandenong	VK3RDD	Melbourne
53.6750	52.6750	Lake Mountain	VK3RTN	Melbourne
53.9750	52.9750	Mt Buller	VK3RGM	Mt Buller
146.6500	146.0500	Donalds Knob	VK3REG	East Gippsland
146.6500	146.0500	Mt Wombat	VK3RGV	Shepparton
146.7000	146.1000	Mt Mitta Mitta	VK3RNC	Corryong
146.7000	146.1000	Ouyen	VK3RON	Ouyen
146.7500	146.1500	Mt Bunninyong	VK3RBA	Ballarat
146.8000	146.2000	Mt. Tassie	VK3RLV	Latrobe Valley
146.8000	146.2000	Mildura	VK3RMA	Mildura
146.8500	146.2500	Kinglake	VK3RMN	
146.9000	146.3000	Smeaton Hill	VK3RBS	Ballarat
146.9000	146.3000	Mt. Nowa Nowa	VK3REB	Bairnsdale
146.9000	146.3000	Swan Hill	VK3RSH	Swan Hill
146.9500	146.3500	Mt William	VK3RWZ	The Grampian
147.0000	146.4000	Mt Anakie	VK3RGL	Geelong
147.0000	146.4000	Mt Big Ben	VK3RNE	Wodonga
147.0250	147.6250	Mt Fatigue	VK3RGS	Toora
147.0500	147.6500	Mt Livingstone	VK3RGO	Omeo
147.0500	147.6500	Robinvale	VK3RVL	Robinvale
147.0500	147.6500	Mt Warrnambool	VK3RWL	Warrnambool
147.0750	147.6750	Heathmont	VK3RCR	Melbourne
147.1000	147.7000	Mt Porepunkah	VK3RPB	Bright
147.1000	147.7000	Bass Hill	VK3RSG	Sth Gippsland
147.1250	147.7250	Geelong	VK3RGC	Geelong
147.1500	147.7500	Mt Alexander	VK3RCV	Bendigo
147.1750	147.7750	Olinda	VK3REC	Melbourne
147.2250	147.8250	Mt Baw Baw	VK3RWG	West Gippsland
147.2500	147.8500	Mt Macedon	VK3RMM	Melbourne
147.2750	147.8750	Mt Cawley	VK3ROW	Colac
147.3000	147.9000	Victoria Wide	VK3RWP	Wicen Portable
147.3500	147.9500	Olinda	VK3RTY	RTTY Melbourne
434.2750	439.2750	Mt Macedon	VK3RMM	Wicen Melb.
438.0750	433.0750	Mt St Leonard	VK3RMU	Melbourne
438.1750	433.1750	Devils River	VK3RUG	Alexandra

OUT PUT TXFREQ	INPUT RXFREQ	SITE		COVERAGE
438.2250	433.2250	Olinda	VK3ROU	Melbourne
438.2750	433.2750	Victoria Wide	VK3RWE	WICEN Portable
438.3750	433.3750	Carrajong	VK3RGU	Gippsland
438.4750	433.4750	Mt Hollowback	VK3RBU	Ballarat
438.4750	433.4750	Bendigo	VK3RCV	Bendigo
438.5250	433.5250	Mitcham	VK3RAD	Melbourne
438.5250	433.5250	Mt Stanley	VK3RNU	Wangaratta
438.5250	433.5250	Merbein	VK3RRU	Mildura
438.6250	433.6250	Victoria Wide	VK3RWI	WICEN Portable
438.6750	433.6750	Mt William	VK3RWU	The Grampians
439.3750	434.3750	Glen Waverley	VK3RSE	Melbourne
439.4250	434.4250	Chesney Vale	VK3RDU	Benalla
439.5750	434.5750	Mt Anakie	VK3RGL	Geelong
439.7250	434.7250	Arthurs Seat	VK3RPU	Melbourne
53.7250	52.7250	Calliope Range	VK4RGA	Gladstone
53.7250	53.1250	Mount Haren	VK4RIK	Cairns & Dist
146.6250	146.0250	Gladstone	VK4RGT	Gladstone
146.6500	146.0500	Roma	VK4ROM	Roma
146.6750	146.0750	Mt Kiangarow	VK4RET	
146.6750	146.0750	Longlands Gap	VK4RTA	Atherton
146.7000	146.1000	Mt Archer	VK4RAR	Rockhampton
146.7000	146.1000	Mt Stuart	VK4RAT	Townsville
146.7000	146.1000	Springbrook	VK4RGC	Gold Coast
146.7000	146.1000	Mount Isa	VK4RMI	Mount Isa
146.7250	146.1250	Mt Gordon	VK4RSB	Bowen
146.7500	146.1500	Mt Lofty	VK4RDD	Toowoomba
146.7750	146.1750	Proserpine	VK4RDY	
146.8000	146.2000	Mt Goonaneman	VK4RBU	Bundaberg
146.8000	146.2000	Thursday Island	VK4RTI	
146.8000	146.3500	Weipa	VK4RWP	Cape York
146.8500	146.2500	Buderim	VK4RSC	Sunshine Coast
146.8750	146.2750	Chinchilla	VK4RCH	Chinchilla
146.9000	146.3000	Mt Stradbroke	VK4RAI	Ipswich
146.9000	146.3000	Calliope Range	VK4RGA	Gladstone
146.9250	146.3250	Mount Mee	VK4RRC	Redcliff
146.9500	146.3500	Mt Bellenden Ker	VK4RCA	Cairns
146.9750	146.3750	Blue Mtn Nebo	VK4RRR	Sarina
147.0000	146.4000	Mt Glorious	VK4RBN	Brisbane
147.0000	146.4000	Black Mtn	VK4RMK	Mackay
147.1000	147.7000	Boulder Mtn	VK4RGY	Gympie
147.1500	147.7500	Spring Hill	VK4RAG	Brisbane
147.1500	147.7500	Kedron	VK4RWI	WICEN Portable
147.3000	147.9000	Mt Glorious	VK4RQT	Brisbane & Dist
147.3500	147.9500	Mt Inkerman	VK4RII	Burdekin
147.6500	147.050	Mt Cotton	VK4RBT	Brisbane
147.6750	147.0750	Mt Cotton	VK4RBT	Brisbane
147.8250	147.2250	Manly West	VK4REG	Brisbane
147.8500	147.2500	Mt Devlin	VK4RCB	
438.0250	433.0250	Mt Tamborine	VK4RTQ	Brisbane & Dist
438.0750	433.0750	Buderim	VK4RSC	Sunshine Coast
438.2250	433.2250	Mt Stuart	VK4RAT	Townsville
438.2250	433.2250	Springbrook	VK4RGC	Gold Coast
438.3750	433.3750	Ipswich	VK4RWM	Ipswich
438.4250	433.4250	Proserpine	VK4RMU	Mackay
4338.4750	433.4750	Maleny	VK4RXX	
438.5000	433.5000	Hodgson Range	VK4RHR	Clermont
438.5250	433.5250	Mt Coot-Tha	VK4RBC	Brisbane
438.6250	433.6250	Spring Hill	VK4RAG	Brisbane
438.6250	433.6250	Kedron	VK4RWI	WICEN Portable
438.6750	433.6750	Mt Goonaneman	VK4RBU	Bundaberg
438.7000	433.7000	Mt Mowbullan	VK4RDB	Darling Downs
438.8250	433.8250	Mt Boulder	VK4RGY	Gympie
438.9500	433.9500	Redbank Plains	VK4RBA	Brisbane
439.2750	434.2750	Toowoomba	VK4RDU	Toowoomba
439.3500	434.3500	Mount Haren	VK4RIK	Cairns & Dist
146.6500	146.0500	Naracoorte	VK4RNC	Naracoorte
146.6750	146.0750	O'Halloran Hill	VK5RSV	
146.7000	146.1000	The Bluff	VK5RMN	Pt Pirie & Dist
146.8000	146.2000	Coolanie	VK5REP	Cowell
146.8250	146.2250	Angaston	VK5RBV	Barossa Valley
146.8500	146.2500	Houghton	VK5RHO	Adelaide
146.9000	146.3000	Mount Gambier	VK5RMG	Mt Gambier

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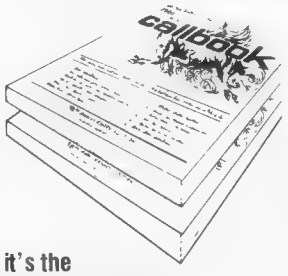

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- A High-performance communications receiver
- High-power HF and VHF amplifiers
- Digital audio memory keyer

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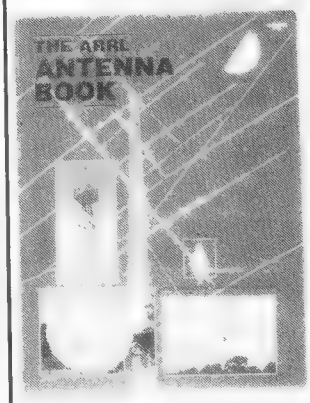

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OUT PUT TXFREQ	INPUT RXFREQ	SITE		COVERAGE
147.0000	146.4000	Crafers	VK5RAD	Adelaide
438.3250	433.3250	Mount Gambier	VK5ROH	
438.4250	433.4250	Angaston	VK5RBV	Barossa Valley
438.5250	433.5250	Crafers	VK5RVP	Adelaide
1381.2500	1261.2500		VK5RWH	Adelaide
29.6300	29.5300		VK6RHF	Perth
53.8000	52.0000	Tic Hill	VK6RTH	Perth
146.6500	146.050	Bunbury	VK6RSW	Bunbury
146.6750	146.0750	Whim Creek	VK6RCA	Carnarvon
146.7000	146.1000	Roleystone	VK6RAP	Perth
146.7250	146.1250	Albany	VK6RAL	Albany
146.7500	146.1500	Esperance	VK6RES	Esperance
146.7500	146.1500	Koolan Island	VK6RKI	Koolan Island
146.7500	146.1500	Lesmurdie	VK6RLM	Perth
146.8000	146.2000	Tic Hill	VK6RTH	Perth
146.8000	146.2000	Karratha	VK6RWP	Karratha
146.8250	146.2250	Mt Barker	VK6RAA	Albany
146.8500	146.2500	Northwest Cape	VK6REX	Exmouth
146.8500	146.2500	Kambalda	VK6RKB	Kalgoorlie
146.8750	146.2750	O'Connor	VK6RSR	Perth
146.9000	146.3000	Mt William	VK6RMW	Bunbury
146.9500	146.3500		VK6RPD	Perth
146.9500	146.3500	Shay Gap	VK6RSG	Shay Gap
146.9750	146.3750	State Wide	VK6REE	WICEN Portable
147.0000	146.4000	Kalgoorlie	VK6RAK	Kalgoorlie
147.0000	146.4000	Fairfield	VK6RAW	Katanning
147.0000	146.4000	State Wide	VK6REE	WICEN Portable
147.0000	146.4000		VK6RGN	Geraldton
147.0000	146.0000	Port Hedland	VK6RNW	Port Hedland
147.0500	147.6500	Roleystone	VK6RTY	RTTY Perth
147.1000	147.7000	Mt Mambup	VK6RWC	Perth
147.1750	147.7750	W A Wide	VK6RIC	WICEN Portable
147.2000	147.8000	Cataby	VK6RCT	Cataby
147.2250	147.8250	Hoddywell	VK6RHW	Toodyay
147.2500	147.8500	Saddleback	VK6RMS	Boddington
147.3000	147.9000	Ocean Hill	VK6REN	Eneabba
147.3500	147.9500	Busselton	VK6RBN	Busselton
438.2250	433.2250	Tic Hill	VK6RTH	Perth
438.5250	433.5250	Roleystone	VK6RUF	Perth
438.6750	433.6750	Busselton	VK6RBN	Busselton
53.8250	52.8250	Mt Duncan	VK7RMD	Hobart
146.6250	146.0250	Mt Duncan	VK7RAD	Rt/Data Hobart
146.7000	146.1000	Mt Wellington	VK7RHT	Hobart
146.7500	146.1500	West Ulverstone	VK7RNW	Ulverstone
146.9000	146.3000	Snow Hill	VK7REC	East Tas
147.0000	146.4000	Mt Barrow	VK7RAA	NE Tas
147.2500	147.8500	Mt Faulkner	VK7RAF	Hobart
438.5000	433.5000	Barren Tier	VK7RIN	Central Tas
438.5500	433.5500	Mt Arthur	VK7RAB	NE Tas
438.5750	433.5750	Millers Bluff	VK7RER	
438.6000	433.6000	Mt Nelson	VK7RTC	Hobart
43.6500	433.6500	Table Cape	VK7RAC	NW Tas
146.6500	146.0500	Nhulunbuy	VK8RMS	Gove
146.7000	146.1000	Karama	VK8RDA	Darwin
146.9500	146.3500	Alice Springs	VK8RCA	Alice Springs
147.0000	146.4000	Palmerston	VK8RTE	Darwin
438.2750	433.2750	Darwin	VK8RDN	Darwin

PREVENT PIRATES

make sure you sell your transmitter to a licensed amateur.

Simplex Repeater List

Freq	Site		Coverage
144.8000	Mt Ginini	VK1RGI	SE NSW
144.8000	Terrey Hills	VK2RMB	Sydney
144.8500	Dural	VK2RWI	Sydney & Dist
144.9000	Hornsby	VK2RPH	Sydney
145.0500	Mt Nardi	VK2RPL	Lismore
147.5750	Mt Kaputar	VK2RAB	Gunnedah
147.5750	Mt Canobolas	VK2RAO	Orange
147.5750	Mt Murray	VK2RAW	Wollongong
147.5750	Mt Coramba	VK2RCH	Coffs Harbour
147.5750	Mt Bindo	VK2RDX	East NSW
147.5750	Mt Bingar	VK2RGF	Griffith
147.5750	Pt Lookout	VK2RLO	
147.5750	Mt Nardi	VK2RPL	Lismore
147.5750	Middle Brother	VK2RPM	Port Macquarie
147.5750	High Range	VK2RPS	South Highlands
147.5750	Mt Tumorrama	VK2RPT	Tumut
147.5750	Grundy's Mountain	VK2RPW	Tamworth
147.5750	Mt Cambewarra	VK2RSD	Nowra
147.5750	Mt Crawney	VK2RTM	
147.6000	Somersby	VK2RAG	Gosford
438.8750	Mt Nardi	VK2RPL	Lismore
144.4350	Mt Bainbridge	VK3RMV	
144.8000	Red Hill	VK3RPK	Melbourne
144.8000	Sunbury	VK3RPS	Melbourne
144.9000	Lysterfield	VK3RPP	Melbourne
147.5250	Mt Tassie	VK3RBB	Gippsland
147.5500	Chirnside Park	VK3RMC	Melbourne
147.5750	Carrajung	VK3RGU	
147.5750	Mt Wombat	VK3RGV	Shepparton
147.5750	Mt St Leonard	VK3RMU	Melbourne
147.5750	Mt Stanley	VK3RNU	Wodonga
147.5750	St Albans	VK3RPA	Melbourne
147.5750	Mt Warrenheip	VK3RPC	
147.5750	Mt William	VK3RPG	Grampians
147.5750	Bendigo	VK3RPM	Bendigo
147.5750	Sunbury	VK4RPS	Melbourne
147.5750	Merbein	VK3RRU	
147.6000	St Albans	VK3RPA	Melbourne
147.6000	Sunbury	VK3RPS	
432.4350	Mt Bainbridge	VK3RMV	
432.4500	Macleod	VK3RAI	
439.2000	St Albans	VK3RPA	
144.8500	Mt Coot-tha	VK4RZB	Brisbane
144.900	Mt Archer	VK4RAR	Rockhampton
144.9000	Mt Goonaneman	VK4RBS	Bundaberg
144.9000	Calliope Range	VK4RGA	
144.9000	Wilkes Knob	VK4RZC	Sunshine Coast
145.0500	Mt Cotton	VK4RBT	Brisbane
147.6000	Maleny	VK4RSA	
147.6000	Springbrook	VK4RZA	Gold Coast
147.6000	Mt Coot-tha	VK4RZB	Brisbane
147.6000	Wilkes Knob	VK4RZC	Sunshine Coast
147.6000	Mt Perseverence	VK4RZD	Toowoomba
432.5450	Mt Archer	VK4RAR	
144.5500	Glencoe	VK4RSE	
144.8000	Mount Lofty	VK5VF	Adelaide
147.5750	The Bluff	VK5RMN	Pt Pirie & Dist
147.5750	Mount Graham	VK5RPM	Naracoorte
147.5750	O'Halloran Hill	VK5RSV	Adelaide
52.3200	Cape Lambert	VK6RTT	
52.4600	Nedlands	VK6RPH	
144.6000	Cape Lambert	VK6RTT	
144.8500	Mt Barker	VK6RAA	Mt Barker
144.8500	Fairfield	VK6RAW	Katanning
144.8500	Tic Hill	VK6RDT	Perth
144.8500	Saddleback	VK6RMS	Boddington
52.4700	St Leonards	VK7RNT	
147.5750	Snow Hill	VK7RED	
147.5750	Mt Nelson	VK7RIT	
147.5750	Highfield	VK7RTY	
147.6000	Alice Springs	VK8BBS	

ATV Repeater List - January 1990

Outputs Tx1FREQ TX2FREQ	Input RFREQ SITE	COVERAGE
579.2500	440.3000 Kariong	VK2RTG Gosford
579.2500	444.2500 Mt Big Ben	VK3RTG Wodonga
579.2500	428.3750 Swan Hill	VK3REX Swan Hill
579.2500	426.2500 Olinda	VK3RTV Melbourne
579.2500	426.2500 Bendigo	VK3RMZ Bendigo
579.2500	426.2500 Spring Hill	VK4RTV Brisbane
579.2500	428.3750 Mt Stuart	VK4RAT Townsville
579.2500	444.2500 O'Halloran Hill	VK5RTV Adelaide
579.2500	428.3750 Roleystone	VK6RAP Perth
428.3750 - 431.7500	444.2500 Mt Duncan	VK7RTV Hobart
579.2500	446.3750 Kelcey Tier	VK7RAE

Beacons - February 1990

Freq	Site	
52.4100	Mt Majura	VK1RCC
144.4100	Mt Majura	VK1RCC
432.4100	Melba	VK1RBC
1296.4100	Melba	VK2RBC
52.3250	Tighes Hill	VK2RHV
52.4200	Dural	VK2RSY
53.6250	Sugarloaf Range	VK2RSN
144.4200	Dural	VK2RSY
144.9500	Turramurra	VK2RCW
432.4200	Dural	VK2RSY
1296.4200	Dural	VK2RSY
52.3300	Mt Anakie	VK3RGL
53.9000	Olinda	VK3RMS
144.4300	Glen Waverley	VK3RTG
144.5300	Mt Anakie	VK3RGG
144.5350	Moe	VK3RGI
144.9500	Mt Waverley	VK3RCW
146.7000	Ferny Creek	VK3RML
432.4300	Glen Waverley	VK3RTG
432.5300	Mt Anakie	VK3RGG
432.5350	Mt Buninyong	VK3RMB
52.4400	Mt St John	VK4RTL
52.4450	Mount Haren	VK4RIK
144.4000	Mt Mowbullan	VK4RTT
144.4450	Mount Haren	VK4RIK
144.4450	Mt Stuart	VK4RTL
432.4400	Mt Coot-Tha	VK4RSD
432.4450	Mount Haren	VK4RIK
432.4450	Mt Stuart	VK4RTL
1296.4400	Mt Coot-Tha	VK4RSD
1296.4450	Mount Haren	VK4RIK
52.4500	Adelaide	VK5VF
50.0660	Perth	VK6???
52.3200	Cape Lambert	VK6RTT
52.3500	Kalgoorlie	VK6RTU
52.4650	Albany	VK6RTW
144.0200	Busselton	VK6RBS
144.4650	Albany	VK6RTW
144.6500	Kalgoorlie	VK6RTU
145.0000	Cloverdale	VK6RPH
420.1000	Roleystone	VK6RAP
432.0600	Busselton	VK6RBS
432.1400	Cloverdale	VK6RPR
432.4650	Albany	VK6RTW
432.5650	Kalgoorlie	VK6RTU
434.9250	Lesmurdie	VK6RWC
1296.1800	Busselton	VK6RBS
1296.4200	Nedlands	VK6RPR
52.3700	Mt Nelson	VK7RST
62.4700	St Leonards	VK7RNT
144.4700	Newnham	VK7RMC
50.0560	Darwin	VK8VF
50.2000	Fannie Bay	VK8VF
52.4850	Alice Springs	VK8RSB
144.0100	Darwin	VK8VF
144.4850	Alice Springs	VK8RSB

Broadcasting Stations

Legend

The following symbols used against Australian stations denote:

* Relays or transmits relayed programmes
\+ Position not shown due to use of two transmitter towers widely separated
@ Power drops to 1KW at night
-T After call-sign signifies translator station
% Directional antenna

Station	Ident	Freq (kHz)	Position	
New South Wales				
Albury	2AY	1494	36 03'S	146 58'E
Armidale %	2AD	1134	30 33'S	151 36'E
Armidale *	2AN	720	30 30'S	151 40'E
Bathurst % H24	2BS	1503	33 22'S	149 32'E
Bega *	2BA	810	36 43'S	149 49'E
Bega %	2BE	765	36 44'S	149 56'E
Bourke	2WEB	585	30 06'S	145 59'E
Bowral	2ST-T	1215	34 29'S	150 24'E
Broken Hill	2BH	567	31 56'S	141 27'E
Broken Hill % *	2NB	999	31 56'S	141 29'E
Byrock % *	2BY	657	30 39'S	146 25'E
Canberra % H24	2CA	1053	35 14'S	149 07'E
Canberra % H24	2CC	1206	35 13'S	149 07'E
Canberra *	2CN	666	35 13'S	149 07'E
Canberra *	2CY	846	35 13'S	149 07'E
Canberra	2XX	1008	35 13'S	149 07'E
Cobar	2DU-T	972	31 32'S	145'51'E
Coffs Harbour H24	2CS	639	30 29'S	153 02'E
Cooma	2XL	918	36 14'S	149 09'E
Cooma	2CP	1602	36 14'S	149 08'E
Corowa *	2CO	675	35 57'S	146 25'E
Cumnock *	2CR	549	32 56'S	148 42'E
Deniliquin	2QN	1521	35 37'S	144 55'E
Dubbo	2DU	1251	32 16'S	148 40'E
Glen Innes *	2GL	819	29 47'S	151 46'E
Gosford * %	2GO	801	33 20'S	151 28'E
Goulburn	2GN	1368	34 45'S	149 42'E
Grafton %	2GF	1206	29 40'S	152 59'E
Grafton *	2NR	738	29 29'S	153 07'E
Griffith %	2RG	963	34 20'S	146 08'E
Gunnedah	2MO	1080	30 59'S	150 13'E
Inverell	2NZ	1188	29 47'S	151 13'E
Katoomba	2KA	783	33 43'S	150 23'E
Kempsey %	2MC	531	31 06'S	152 50'E
Kempsey *	2KP	684	31 00'S	152 57'E
Lismore	2LM	900	28 46'S	153 21'E
Lithgow *	2LG	1395	33 29'S	150 09'E
Lithgow %	2LT	900	33 24'S	150 06'E
Moree	2VM	1530	29 29'S	149 54'E
Moruya	2BE-T	765	35 51'S	150 08'E
Mudgee % H24	2MG	1449	32 35'S	149 34'E
Murwillumbah *	2ML	720	28 15'S	153 30'E
Murwillumbah %	2MW	972	28 19'S	153 30'E
Muswellbrook * %	2NM	981	32 18'S	150 50'E
Muswellbrook % *	2UH	1044	32 14'S	150 55'E
Narooma	2BE-T	1584	36 14'S	150 09'E
Newcastle H24	2HD	1143	32 52'S	151 42'E
Newcastle H24	2KO	1413	32 51'S	151 42'E
Newcastle *	2NA	1512	32 48'S	151 40'E
Newcastle	2EA	1584	32 52'S	151 42'E
Newcastle *	2NC	1233	32 48'S	151 40'E
Nowra * %	2ST	999	34 53'S	150 32'E
Orange %	2GZ	1089	33 27'S	149 07'E
Parkes	2PK	1404	33 10'S	148 13'E
Penrith	2KA-T	1476	33 44'S	150 40'E
Sydney *	2BL	702	33 56'S	150 53'E
Sydney H24	2CH	1170	33 51'S	151 05'E
Sydney %	2EA	1386	33 50'S	151 04'E
Sydney *	2FC	576	33 56'S	150 53'E
Sydney H24	2GB	873	33 49'S	151 05'E
Sydney H24	2KY	1017	33 50'S	151 04'E
Sydney H24	2SM	1269	33 50'S	151 04'E
Sydney H24	2UE	954	33 51'S	151 04'E

Sydney H24	2UW	1107	33 51'S	151 05'E
Sydney % H24	2WS	1224	33 48'S	150 55'E
Tamworth	2TM	1287	31 10'S	150 55'E
Tamworth *	2NU	648	30 47'S	150 44'E
Taree * %	2TR	756	31 50'S	152 25'E
Taree	2RE	1557	31 55'S	152 28'E
Wagga Wagga	2WG	1152	35 02'S	147'25'E
Wallsend % H24	2NX	1341	33 53'S	151 41'E
Wilcannia *	2WA	1584	31 33'S	143 23'E
Wollongong	2EA	1485	34 32'S	150 53'E
Wollongong H24	2WL	1314	34 31'S	150 52'E
Wollongong *	2WN	1431	34 32'S	150 52'E
Wollongong %	2OO	1575	34 29'S	150 47'E
Young %	2LF	1350	34 20'S	148 20'E
Victoria				
Albury/Wodonga	3AB	990	36 06'S	146 54'E
Ballarat % H24	3BA	1314	37 32'S	143 56'E
Bendigo	3BO	945	36 42'S	144 13'E
Colac %	3CS	1134	38 19'S	143 32'E
Geelong %	3GL	1341	38 10'S	144 27'E
Hamilton	3HA	981	37 41'S	142 01'E
Horsham %	3WM	1089	36 45'S	143 34'E
Horsham	3MW	594	36 39'S	142 16'E
Maryborough % *	3CV	1071	37 02'S	143 49'E
Melbourne % H24	3AK	1503	37 45'S	145 06'E
Melbourne *	3AR	621	37 43'S	144 47'E
Melbourne H24	3AW	1278	37 44'S	145 06'E
Melbourne	3CR	855	37 49'S	145 00'E
Melbourne	3EA	1224	37 37'S	144 56'E
Melbourne H24	3KZ	1179	37 44'S	145 07'E
Melbourne *	3LO	774	37 43'S	144 47'E
Melbourne %	3MP	1377	37 56'S	145 13'E
Melbourne * H24	3TT	1026	37 44'S	145 06'E
Melbourne H24	3UZ	927	37 44'S	145 06'E
Melbourne H24	3XY	1422	37 44'S	145 06'E
Mildura	3MA	1467	34 11'S	142 07'E
Omeo % *	3MT	720	37 09'S	147 40'E
Sale %	3TR	1242	38 03'S	147 02'E
Sale *	3GI	828	38 11'S	147 06'E
Shepparton	3SR	1260	36 23'S	145 32'E
Swan Hill	3SH	1332	35 25'S	143 34'E
Wangaratta %	3NE	1566	36 19'S	146 22'E
Warragul %	3UL	531	38 06'S	145 55'E
Warrnambool %	3YB	882	38 20'S	142 30'E
Warrnambool *	3WL	1602	38 22'S	142 30'E
Queensland				
Atherton %	4AM	558	17 02'S	145 29'E
Atherton *	4AT	720	17 18'S	145 33'E
Biloela *	4CC-T	927	24 24'S	150 30'E
Brisbane % H24	4BC	1116	27 32'S	152 58'E
Brisbane % H24	4BH	882	27 28'S	153 09'E
Brisbane % * H24	4BK	1296	27 28'S	153 07'E
Brisbane	4EB	1053	27 31'S	153 00'E
Brisbane H24	4IO	1008	27 23'S	153 14'E
Brisbane %	4KQ	693	27 23'S	153 14'E
Brisbane *	4QG	792	27 19'S	153 01'E
Brisbane *	4QR	612	27 19'S	153 01'E
Bundaberg %	4BU	1332	24 51'S	152 24'E
Cairns %	4CA	846	16 54'S	145 49'E
Cairns *	4QY	801	17 03'S	145 47'E
Charleville	4VL	918	26 23'S	146 12'E
Charters Towers	4GC	828	20 04'S	146 18'E
Cloncurry	4LM-T	1458	20 42'S	140 30'E
Cunnamulla	4VL-5	1584	28 07'S	145 41'E
Dalby	4QS	747	27 09'S	151 18'E
Dysart %	4HI-5	945	22 35'S	148 22'S
Eidsvold *	4QO	855	25 24'S	151 07'E
Emerald *	4QD	1548	23 26'S	148 09'E
Emerald %	4HI	1143	23 32'S	148 12'E
Gladstone % *	4CC	927	23 51'S	151 14'E
Gold Coast %	4GG	1197	28 00'S	153 24'S
Gordonvale	4CA-T	954	17 08'S	145 51'E
Gympie %	4GM	1566	28 13'S	152 41'E
Gympie %	4GY	558	26 10'S	152 50'E
Hughenden *	4HU	1485	20 51'S	144 11'E
Hughenden	4GC-T	765	20 51'S	144 11'E
Innisfail %	4KZ	531	17 32'S	146 03'E
Julia Creek % *	4JK	567	20 39'S	141 49'E
Kingaroy *	4SB	1071	26 24'S	151 50'E
Longreach	4LG	1098	23 23'S	144 17'E
Longreach *	4QL	540	23 23'S	144 17'E
Mackay %	4QA	756	21 06'S	149 13'E
Mackay %	4MK	1026	21 07'S	149 13'E
Maryborough	4MB	1161	25 28'S	152 44'E
Moranbah	4HI-T	1215	22 00'S	148 02'E
Mossman *	4MS	639	16 25'S	145 23'E
Mount Isa	4LM	666	20 43'S	139 30'E
Mount Isa *	4MI	1080	20 40'S	139 30'E
Nambour %	4SS	828	26 38'S	153 05'E
Oakey	4AK	1242	27 28'S	151 45'E
Pialba % *	4QB	855	25 16'S	152 49'E
Rockhampton *	4RK	837	23 27'S	150 27'E
Rockhampton	4RO	990	23 35'S	150 51'E
Roma	4ZR	1476	26 33'S	148 49'E
Southport *	4SO	1593	28 02'S	153 26'E
St George % *	4QW	711	28 00'S	148 40'E
Thursday Island *	4TI	1062	10 35'S	142 13'E
Toowoomba H24	4GR	864	27 36'S	151 55'E
Townsville % H24	4AY	891	19 19'S	147 02'E
Townsville % H24	4TO	774	19 19'S	147 02'E
Townsville * H24	4QN	630	19 31'S	147 20'E
Tully	4KZ-T	693	18 00'S	145 56'E
Warwick %	4WK	963	28 01'S	151 58'E
Weipa	4WP	1044	12 37'S	141 53'E
South Australia				
Adelaide * % H24	5AA	1386	34 45'E	138 36'E
Adelaide * H24	5AD	1323	34 50'S	138 35'E
Adelaide *	5AN	891	35 06'S	138 31'E
Adelaide %	5CL	729	35 06'S	138 31'E
Adelaide H24	5DN	972	34 50'S	138 34'E
Adelaide *	5KA	1197	34 50'S	138 35'E
Adelaide	5UV	531	34 50's	138 35'E
Crystal Brook *	5PI	1044	33 19'S	138 16'E
Leigh Creek South *	5LC	1602	30 36'S	138 24'E
Mount Gambier *	5MG	1584	37 49'S	140 47'E
Mount Gambier % * H24	5SE	963	37 48'S	140 43'E
Murray Bridge *	5MU	1458	35 07'S	139 15'E
Naracoorte % *	5PA	1161	36 57'S	140 40'E
Port Augusta % *	5AU	1242	32 50'S	137 56'E
Port Lincoln *	5LN	1485	34 44'S	135 53'E
Port Pirie *	5CK	639	33 21'S	138 15'E
Renmark *	5MV	1305	34 16'S	140 37'E
Renmark *	5RM	801	34 14'S	140 38'E
Streaky Bay % *	5SY	693	32 45'S	134 12'E
Tumby Bay H24	5CC	765	34 15'S	136 20'E
Woomera *	5WM	1584	31 12'S	136 49'E
Western Australia				
Albany *	6AL	630	35 01'S	117 49'E
Albany	6VA	783	35 01'S	117 51'E
Bridgetown *	6BY	900	34 03'S	116 10'E
Bridgetown *	6BR	1044	35 56'S	116 07'E
Broome *	6BE	675	17 58'S	122 14'E
Bunbury *	6TZ	963	33 21'S	115 45'E
Busselton *	6BS	684	33 39'S	115 13'E
Carnarvon *	6CA	846	24 52'S	113 40'E
Carnarvon	6LN	666	24 52'S	113 40'E
Collie *	6CI	1134	33 22'S	116 11'E
Dalwallinu *	6DL	531	30 17'S	116 36'E
Derby *	6DB	873	17 21'S	123 40'E
Esperance	6ED	837	33 45'S	121 51'E
Esperance %	6SE	747	33 46'S	121 52'E
Exmouth *	6XM	1188	21 58'S	114 08'E
Exmouth	6LN-T	747	21 58'S	114 08'E
Geraldton	6GE	1008	28 44'S	114 37'E
Geraldton *	6GN	828	28 44'S	114 37'E

Kalgoorlie *	6GF	648	30 47'S	121 24'E
Kalgoorlie	6KG	981	30 44'S	121 30'E
Karratha	6KA	1260	20 44'S	116 50'E
Katanning *	6WB	1071	33 39'S	117 30'E
Kununurra *	6KW	756	15 46'S	128 44'E
Mandurah	6MM	1116	32 38'S	115 48'E
Manjimup %	6MJ	738	34 19'S	116 08'E
Merredin *	6MD	1098	31 30'S	118 12'E
Mount Newman *	6MN	567	23 21'S	119 44'E
Mount Tom Price *	6TP	567	22 42'S	117 46'E
Mount Tom Price *	6KA-T	765	22 42'S	117 46'E
Narrogin *	6NA	918	32 58'S	117 13'E
Northam *	6AM	864	31 40'S	116 37'E
Northam *	6NM	612	31 40'S	116 41'E
Pannawonica *	6PN	567	21 40'S	116 20'E
Paraburdoo *	6PU	567	21 13'S	117 40'E
Paraburdoo *	6KA-T	765	23 13'S	117 40'E
Perth * H24	6IX	1080	31 56'S	115 55'E
Perth * H24	6KY	1206	31 56'S	115 55'E
Perth %	6NR	927	32 01'S	115 54'E
Perth * H24	6PM	990	32 00'S	115 50'E
Perth * H24	6PR	882	32 00'S	115 49'E
Perth *	6WF	720	31 51'S	115 49'E
Perth *	6WN	810	31 51'S	115 49'E
Port Hedland *	6PH	603	20 24'S	118 40'E
Port Hedland	6NW	1026	20 23'S	118 35'E
Wagin *	6WA	558	33 20'S	117 05'E
Wyndham *	6WH	1017	15 28'S	128 06'E
Tasmania				
Burnie	7BU	558	40 58'S	145 44'E
Devonport	7AD	900	41 10'S	146 19'E
Fingal % *	7FG	1161	41 41'S	147 52'E
Hobart	7HO	864	42 55'S	147 19'E
Hobart %	7HT	1080	42 56'S	147 30'E
Hobart *	7ZL	585	42 55'S	147 30'E
Hobart % *	7ZR	936	42 55'S	147 30'E
Kelso % *	7NT	711	41 06'S	146 47'E
Launceston %	7EX	1008	41 27'S	147 13'E
Launceston	7LA	1098	41 23'S	147 09'E
Queenstown *	7QN	630	42 03'S	145 31'E
Queenstown	7QT	837	42 06'S	145 32'E
Saint Helens *	7SH	1584	41 20'S	148 17'E
Scottsdale %	7SD	540	41 06'S	147 32'E
Northern Territory				
Alice Springs	8HA	900	23 46'S	133 52'E
Alice Springs *	8AL	783	23 46'S	133 52'E
Alice Springs	VL8A	2310 Ngt 4835 Day	23 49'S	133 51'E
Darwin	8DN	1242	12 26'S	130 51'E
Darwin	8DR	857	12 25'S	130 51'E
Gove *	8GO	990	12 11'S	136 47'E
Jabiru *	8JB	747	12 40'S	132 53'E
Katherine * H24	8KN	639	14 24'S	132 11'E
Katherine*	8DN-T	765	14 27'S	132 16'E
Katherine	VL8K	2485 Ngt 5025 Day	14 24'S	132 11'E
Tennant Greek* H24	8TC	684	19 40'S	134 11'E
Tennant Creek	VL8T	2325 Ngt 4910 Day	19 40'S	134 16'E

Note:
8DR transmits on 857 kHz 12 39'40'S 131 02'13'E every Tuesday btn 1430Z and 1530Z. 8DN freq 765 kHz retransmits 8DN 1242 kHz programs to Katherine.

Radio Australia (RA) Transmission Schedule

RA Transmitters
Radio Australia broadcasts through transmitting stations at Shepparton, Carnarvon and Darwin.

ASIA

English Service
23 hours daily reaching Bangladesh, Brunei, Burma, China, Hong Kong, India, Indonesia, Kampuchea, Korea, Laos, Malaysia, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, Thailand and Vietnam.

0000 - 0100	15240kHz
0100 - 0900	21720 kHz
0100 - 0910	17715 & 17750 kHz
0900 - 1100	17830 kHz
0900 - 1130	11895 kHz
1100 - 1330	9770 kHz
1200 - 1730	7205 kHz
1330 - 1530	9580 kHz
1400 - 1530	6035 kHz
1530 - 1730	9770 kHz
1530 - 2100	6035 kHz
1800 - 2100	7215 kHz
2200 - 2400	15240 kHz
0000 - 0900	15395 kHz

Broadcasting through Carnarvon, Darwin and Shepparton

PAPUA NEW GUNIEA

Programs in English
Times shown are universal time coordinated.
Add for Local Time: +9 Irian Jaya; +10 Papua New Guinea, Bathurst and Melville Island; + 11 Vanuatu.

English Service
Twenty-three hours daily reaching Papua New Guinea, Irian Jaya, Vanuatu, Bathurst and Melville Islands. Includes broadcasts in widely used regional English.

Regional English:

0800 - 0945	6080, 9760 & 5995 kHz

English:

0100 - 0930	15165 kHz
0900 - 1000	11800 kHz
1100 - 1300	11800 & 9710 kHz
1200 - 2030	6080 kHz
1400 - 1600	11800 & 9710 kHz
2000 - 2130	9620 kHz
2100 - 2400	15160 kHz
2330 - 0230	17725 kHz

English Service (continuous broadcasts)

0130 - 0530	17715 kHz
0200 - 0730	17795 kHz
0300 - 0800	15160 kHz
0400 - 0700	15320 kHz
0600 - 0840	11910 kHz
0730 - 0930	11720 kHz
0800 - 2130	9580 kHz
0800 - 2000	6045 kHz
1100 - 2000	5995 kHz
1200 - 2030	6060 kHz
1800 - 2100	7215 kHz
2100 - 0100	17795 & 15160 kHz
2100 - 0730	15395 kHz
2100 - 1000	15240 kHz
2200 - 0100	15320 kHz

PACIFIC

Programs in English.
Times shown are universal time coordinated.
Add for Local Time: +10 Micronesia, Guam; +11 New Caledonia, Micronesia, Vanuatu, Solomon Islands, Wallis and Futuna; +11.30 Norfolk Island, Nauru; +12 New Zealand, Kiribati, Fiji, Tuvalu; +13 Tonga.
Subtract for Local Time: -10 Cook Islands, French Polynesia, Hawaii; - 11 Niue, Western Samoa and American Samoa.

AFRICA

Programs in English and French reaching Western and Southern Africa.
Times shown are universal time coordinated.

Add for Local Time: +1 Cameroon, Nigeria, Zaire; +2 Botswana, Lesotho, Malawi, South Africa, Zambia and Zimbabwe; +3 Djibouti, Ethiopia, Kenya, Madagascar, Tanzania, Uganda; +4 Mauritius, Seychelles.

English Service
Three-and-a-half hours daily.
0400 - 0730 17865 kHz
Broadcast through Shepparton.
0300 - 0400 15320 & 17865 kHz
Broadcast through Shepparton

RA NEWS REPORTING

English Service

World News: ten-minute bulletins every hour on the hour.

World and Pacific News: ten-minute bulletins at 0900, 1000, 1800, 1900 and 2000 on frequencies directed to the Pacific.

Australian News: ten-minute bulletins at 0130, 0430, 0830, 1230, 1630, 1830, 2030 and 2330.

Report from Asia: background to the news from RA correspondents. Saturday 1410, 1710, 2010 and 2310.

The Week in Canberra: News from the Australian national capital. Friday 1410, 1810, 2010 and 2210.

Television Frequencies

Australia

	Channel	Frequency	
VHF		Vision	Sound
Band I	0	46.25	51.75
	1	57.25	62.75
	2.	64.25	69.75
VHF	3	86.25	91.75
Band II	4	95.25	100.75
	5	102.25	107.75
	5A	138.25	143.75
VHF			
Band III	6	175.25	180.75
	7	182.25	187.75
	8	189.25	194.75
	9	196.25	201.75
	10	209.25	214.75
	11	216.25	221.75

International TV Frequencies (MHz)
VHF

New Zealand

	Channel	Frequency	
VHF		Vision	Sound
Band I		45.25	50.75
	2	55.25	60.75
	3	62.25	67.75
Band III	4	175.25	180.75
	5	182.25	187.75
	6	189.25	194.75
	7	196.25	201.75
	8	203.25	208.75
	9	210.25	215.75

European (CCIR)

Channel	Frequency	
	Vision	Sound
E2	48.25	53.75
E3	55.25	60.75
E4	62.25	67.75
E5	175.25	180.75
E6	182.25	187.75
E7	189.25	194.75
E8	196.25	201.75
E9	203.25	208.75
E10	210.25	215.75
E11	217.25	222.75
E12	224.25	229.75

UK

Channel	Frequency	
	Vision	Sound
B1	45.00	41.50
B2	51.75	48.25
B3	56.75	53.25
B4	61.75	58.25
B5	66.75	63.25
B6	179.75	176.25
B7	184.75	181.25
B8	189.75	186.25
B9	194.75	191.25
B10	199.75	196.25
B11	204.75	201.25
B12	209.75	206.25
B13	214.75	211.235

Australian UHF Frequencies

Band IV
between 520-585 MHz
Band V
between 614-820 MHz

Notes
1. B IV will be used for Main Stations
2. B V will be used for Translators
3. Planned for 7 MHz channels.

CCIR-UHF Frequencies

Europe, the UK and many other countries utilize the same band IV and Band V Frequencies

Channel	Band IV	(CCIR)
	Vision	Sound
21.	471.25	477.75
22.	479.25	485.75
23.	487.25	493.75
24.	495.25	501.75
25.	503.25	509.75
26.	511.28	517.75
27.	519.25	525.75
28.	527.25	533.75
29.	535.25	541.75
30.	543.25	549.75
31.	551.25	557.75
32.	559.25	565.75
33.	567.25	573.75
34.	575.25	581.75
35.	583.25	589.75
36.	591.25	597.75
37.	599.25	605.75
38.	607.25	613.75
39.	615.25	621.75
40.	623.25	629.75
41.	631.25	637.75
42.	639.25	645.75
43.	647.25	653.75
44.	655.25	661.75
45.	663.25	669.75
46.	671.25	677.75
47.	679.25	685.75
48.	687.25	693.75
49.	695.25	701.75
50.	703.25	709.75
51.	711.25	717.75
52.	719.25	725.75
53.	727.25	733.75
54.	735.25	741.75
55.	743.25	749.75
56.	751.25	757.75
57.	759.25	765.75
58.	767.25	773.75
59.	775.26	781.75
60.	783.25	789.75
61.	791.25	797.75
62.	799.25	805.75
63.	807.25	813.75
64.	815.25	821.75
65.	823.25	829.75

ARRL DXCC COUNTRIES LIST

Note: Third party traffic permitted with special events stations in the United Kingdom having the prefix GB only, with exception that GB3 stations are not included in this agreement.
Note: * Indicates current list of countries for which QSLs may be forwarded by the ARRL membership outgoing QSL service.
Note: †Indicates countries with which US amateurs may legally handle third-party message traffic.

PREFIX	COUNTRY	PREFIX	COUNTRY	PREFIX	COUNTRY
A2*	Botswana	CA–CE†*	Chile	D4*	Cape Verde
A3	Tonga	CE9/KC4Δ	Antarctica	D6[26]	Comoros
A4*	Oman	CEØ*	Easter Is	DA–DL2*	Fed Rep of Germany
A5	Bhutan	CEØ*	San Felix	DU–DZ*	Philippines
A6	United Arab Emirates	CEØ†*	Juan Fernandez	EA–EH*	Spain
A7	Qatar	CM,CO†*	Cuba	EA6–EH6*	Canary Is
A9*	Bahrain	CN*	Morocco	EA8–EH8*	Balearic Is
AP–AS	Pakistan	CP†*	Bolivia	EA9–EH9*	Ceuta* and Melilla
BV	Taiwan	CT*	Portugal	EI–EJ*	Ireland
BY,BT,BZ*	China	CT3*	Madeira Is	EL†	Liberia
C2*	Nauru	CU*	Azores	EP–EQ*	Iran
C3*	Andorra	CV–CX†*	Uruguay	ET	Ethiopia
C5†*	The Gambia	CYØ	Sable Is	F*	France
C6*	Bahamas	CYØ	St Paul Is	FT8W*	Cozet
C8–9	Mozambique	D2–3*	Angola	FT8X*	Kerguelen Is

PREFIX	COUNTRY
FT8Z*	Amsterdam & St Paul Is
FG*	Guadeloupe
FJ,FS†*	Saint Martin
FH[26*]	Mayotte
FK*	New Caledonia
FM*	Martinique
FO*	Clipperton Is
FO*	French Polynesia
FP*	St Pierre & Miquelon
FR/G[4*]	Glorioso Is
FR/J,E[4*]	Juan de Nova, Europa
FR*	Reunion
FR/T*	Tromelin
FW*	Wallis & Futuna Is
FY*	French Guiana
G*#	England
GD*	Isle of Man
GI*	Northern Ireland
GJ*	Jersey
GM*	Scotland
GU*	Guernsey & Dep
GW*	Wales
H4*	Solomon Islands
HA,HG*	Hungary
HB*	Switzerland
HBØ	Liechtenstein
HC–HD†*	Ecuador
HC8-HD8†*	Galapagos Is
HH†*	Haiti
HI*	Dominican Rep
HJ–HK†*	Colombia
HKØ†*	Malpelo Is.
HKØ†*	San Andreas & Providencia
HL*	Korea
HO–HP†*	Panama
HQ–HR†*	Honduras
HS*	Thailand
HV*	Vatican
HZ	Saudi Arabia
I*	Italy
ISØ,IMØ*	Sardinia
J2*	Djibouti
J3†*	Grenada
J5	Guinea–Bissau
J6†*	St Lucia
J7†*	Dominica
J8†*	St Vincent & Dep
JA-JS*	Japan
JD1[5*]	Minami Torishima
JD1[6*]	Ogasawara
JT–JV*	Mongolia
JW*	Svalbard
JX*	Jan Mayen
JY†*	Jordan
K,W,N,AA–AK	United States of America
KC6[28]	Ref. V6
KC6[29]	(W Caroline Is) Belau
KG4†*	Guantanamo Bay
KH1†	Baker, Howland Is
KH2†*	Guam
KH3†	Johnston Is
KH4†*	Midway Is
KH5†	Palmyra, Jarvis Is
KH5K†	Kingman Reef
KH6†*	Hawaiian Is
KH7†	Kure Is
KH8†*	American Samoa
KH9†	Wake Is
KHØ†*	Mariana Is
KH7†*	Alaska
KP1†	Navassa Is
KP2†*	Virgin Is
KP4†*	Puerto Rico
KP5[27†]	Desecheo Is
KX6*	Ref. V7
LA–LN*	Norway
LO–LW†*	Argentina
LX*	Luxembourg
LZ*	Bulgaria
OA–OC†*	Peru
OD*	Lebanon
OE*	Austria
OF–OI*	Finland
OHØ*	Aland Is
OJØ*	Market Reef
OK–OM*	Czechoslovakia
ON–OT*	Belgium
OX*	Greenland
OY*	Faroe Is
OX*	Denmark
P2[7*]	Papua New Guinea
P4[31*]	Aruba
PA–PI*	Netherlands
PJ2,4,9*	Bonaire, Curacao (Neth Antilles)
PJ5–8*	St Maarten, Saba, St Eustatius
PP–PY†*	Brazil
PPØ–PYØ†*	Fernando de Noronha
PPØ–PYØ†*	St Peter & St Paul Rocks
PPØ–PYØ†*	Trindade & Martin Vaz Is
PZ*	Suriname
S2*	Bangladesh
S7*	Seychelles
S9	Sao Tome & Principe
SØ[1,32]	Western Sahara
SA–SM*	Sweden
SN–SR*	Poland
ST*	Sudan
STØ*	Southern Sudan
SU*	Egypt
SV–SZ*	Greece
SV5*	Dodecanese
SV9*	Crete
SV/A*	Mount Athos
T2[16]	Tuvalu
T3Ø	W Kiribati (Gilbert & Ocn Is)
T31	C Kiribati (Brit Phoenix Is)
T32	E Kiribati (Line Is)
T5	Somalia
T7*	San Marino
TA–TC*	Turkey
TF*	Iceland
TG,TD†*	Guatemala
TI,TE†*	Costa Rica
T19†*	Cocos Is
TJ	Cameroon
TK*	Corsica
TL[8]	Central African Rep
TN[9]	Congo
TR[10]	Gabon
TT[11]	Chad
TU[12]	Ivory Coast
TY[13]	Benin
TZ[14]	Mali
UA1,3,4,6*	European Russian RSFSR
UA1*	Franz Josef Land
UA2*	Kaliningrad
UA9,Ø	Asiatic RSFSR
UB, UT,UY*	Ukraine
UC*	Byelorussia
UD*	Azerbaijan
UF*	Georgia
UG*	Armenia
UH*	Turkmenistan
UI*	Uzbekistan
UJ*	Tadzhikistan
UL*	Kazhikistan
UM*	Kirghizia
UO*	Moldavia
UP*	Lithuania
UQ*	Latvia
UR*	Estonia
V2†*	Antigua & Barbuda
V3†*	Belize
V4[15†]	St Christopher & Nevis
V6	Federated States of Micronesia (ref KC6)
V7	Marshall Is (ref KX6)
V8*	Brunei
VE,VO,VY†*	Canada
VK†*	Australia
VK†*	Lord Howe Is
VK9†*	Willis Is
VK9†*	Christmas Is
VK9†*	Cocos–Keeling Is
VK9†*	Mellish Reef
VK9†*	Norfolk Is
VKØ†*	Heard Is
VKØ†*	Macquarie Is
VP2E[15]	Anguilla
VP2M[15*]	Montserrat
VP2V[15*]	Brit Virgin Is
VP5*	Turks & Caicos Is
VP8*	Falkland Is
VP8,LU*	South Georgia Is
VP8,LU*	South Orkney Is
VP8,LU*	South Sandwich Is
VP8,CE9,HFØ, LU,4K1*	South Shetland Is
VP9*	Bermuda
VP9*	Chagos
VR6†	Pitcairn Is
VS6*	Hong Kong
VU*	India
VU*	Andaman & Nicobar Is
VU*	Laccadive Is
XA–XI†*	Mexico
XA4–X14*	Revilla Gigedo
XT[17]	Burkina Faso
XU	Kampuchea
XW	Laos
XX9	Macao
XY–XZ	Burma
Y2–Y9[30]	German Dem Rep
YA	Afghanistan
YB–YH[21*]	Indonesia
YI*	Iraq
YJ*	Vanuatu
YK*	Syria
YN†*	Nicaragua
YO–YR*	Romania
YS†*	El Salvador
YT-YU,YZ*	Yugoslavia
YV–YY†*	Venezuela
YVØ†*	Aves Is
Z2*	Zimbabwe
ZB2*	Gibraltar
ZC4[30*]	UK Sov. Base Areas on Cyprus
ZD7	St Helena
ZD8*	Ascension Is
ZD9	Tristan da Cuha & Gough Is
ZF*	Cayman Is
ZK1*	Sth Cook Is
ZK1*	Nth Cook Is
ZK2	Niue
ZK3	Tokelau Is
ZL–ZM*	New Zealand
ZL7*	Chatham Is
ZL8*	Kermadec Is
ZL9*	Auckland & Campbell Is
ZP†*	Paraguay
ZR–ZU*	South Africa
ZR2–ZU2*	Prince Edward & Marion Is
ZR3–ZU3*	(Namibia) SW Africa
1AØ[1]	Sov. Mil. Order of Malta
1S[1]	Spratly Is
3A*	Monaco
3B6,7*	Agalega & St Brandon
3B8*	Mauritius
3B9*	Rodriguez Is
3C	Equatorial Guinea
3CØ	Pagalu Is
3D2*	Fiji & Rotuma Is
3D6†*	Swaziland
3V	Tunisia
3W,XV	Vietnam
3X	Guinea
3Y*	Bouvet
3Y*	Peter Is
4J1	Malyj Vystotkij Is
4P–4S*	Sri Lanka
4U†*	ITU Geneva
4U	HQ, United Nations
4W	Yemen
4X,4Z†*	Israel
5A	Libya
5B*	Cyprus
5H–51	Tanzania

PREFIX	COUNTRY
5N–5O*	Nigeria
5R–5S	Madagascar
5T18*	Mauritania
5U[19]	Niger
5V*	Togo
5W*	Western Samoa
5X	Uganda
5Y–5Z*	Kenya
6V–6W[20]	Senegal
6Y†*	Jamaica
7O	People's Dem Rep of Yemen
7P*	Lesotho
7Q	Malawi
7T-7Y*	Algeria
8P*	Barbados
8Q	Maldive Is
8R†*	Guyana
9G[22]†	Ghana
9H*	Malta
9I–9J*	Zambia
9K*	Kuwait
9L†*	Sierra Leone
9M2,4[23]*	West Malaysia
9M6,8[23]*	East Malaysia
9N	Nepal
9Q-9T*	Zaire
9U[24]	Burundi
9V[25]*	Singapore
9X[24]*	Rwanda
9Y–9Z†*	Trinidad & Tobago
J2/A*	Abu Ail, Jabal at Tair

DXCC NOTES

1 Unofficial prefix.
2 (DA–DL) Only contacts made September 17, 1973 and after, count for this country.
3 (Y2–Y9) Only contacts made September 17, 1973 and after, count for this country.
4 (FR) Only contacts made June 25, 1960 and after, count for this country.
5 (JD,KA1) Formerly Marcus Island.
6 (JD,KA1) Formerly Bonin & Volcano Islands.
7 (P2) Only contacts made September 16, 1975 and after, count for this country.
8 (TL) Only contacts made August 13, 1960 and after, count for this country.
9 (TN) Only contacts made August 15, 1960 and after, count for this country.
10 (TR) Only contacts made August 17, 1960 and after, count for this country.
11 (TT) Only contacts made August 11, 1960 and after, count for this country.
12 (TU) Only contacts made August 7, 1960 and after, count for this country.
13 (TY) Only contacts made August 1, 1960 and after, count for this country.
14 (TZ) Only contacts made June 20, 1960 and after, count for this country.
15 (VP2) For DXCC credit for contacts made May 31, 1958 and before, see page 97 June 1958 QST.
16 (T2,VR8) Only contacts made January 1, 1960 and after, count for this country.
17 (XT) Only contacts made August 5, 1960 and after, count for this country.
18 (58) Only contacts made June 20, 1960 and after, count for this country.
19 (5U) Only contacts made August 3, 1960 and after, count for this country.
20 (6W) Only contacts made June 20, 1960 and after, count for this country.
21 (8F,YB) Only contacts made May 1, 1963 and after, count for this country.
22 (9G) Only contacts made March 5, 1957 and after, count for this country.
23 (9M2,4,6,8) Only contacts made September 16, 1963 and after, count for this country.
24 (9U,9X) Only contacts made July 1, 1962 and after, count for this country.
25 (9V) Only contacts made September 16, 1963 to August 8, 1965, count for West Malaysia.
26 (D6,FH8) Only contacts made July 5, 1975 and after, count for this country.
27 (KP5,KP4) Only contacts made March 1, 1979 and after, count for this country.
28 (KC6) Includes Yap Is. January 1, 1981 and after.
29 (KC6) Includes Yap Is. December 31, 1980 and before.
30 (ZC4) Only contacts made August 16, 1960 and after, count for this country.,
31 (P4) Only contacts made January 1, 1986 and after, count for this country.
32 Contacts with Rio de Oro (Spanish Sahara), EA9, also count for this country.
Δ Also ATØ, DPØ, FT8Y, LU, OR4, VKØ, VP8, Y8, ZL5, ZS1, ZXØ, 3Y, 4K1, 8J1, etc.
QSL via country under whose auspices the particular station is operating. The availability of a third party traffic agreement and a QSL Bureau applies to the country under whose auspices the particular station is operating.

Deleted Countries

Credit for any of these countries can be given if the date of contact with the country in question agrees with the date(s) shown in the corresponding footnote.

Prefix	Country
AC[1,2]	Sikkim
AC4[1,3]	Tibet
C9[4]	Manchuria
CN2[5]	Tangier
CR8[6]	Damao, Diu
CR8[6]	Goa
CR8, CR10[7]	Portuguese Timor
DA-DM[8]	Germany
EA9[9]	Ifni
ET2[10]	Eritrea
FF[11]	Fr West Africa
FH, FB8[12]	Comoros
F18[13]	Fr Indo China
FN8[14]	French India
FQ8[15]	Fr Equatorial Africa
HKØ[16]	Bajo Nuevo
HKØ,KPE,KS4[16]	Serrana Bank & Roncador Cay
I1[17]	Trieste
I5[18]	Italian Somaliland
JD1/7J1[19]	Okino Tori-Shima
JZØ[20]	Netherlands N Guinea
KR6,8,JR6,KA6[21]	Okinawa (Ryukyu Is)
KS4[22]	Swan Islands
KZ5[23]	Canal Zone
P2,VK8[24]	Papua Territory
P2,VK9[24]	Terr New Guinea
PK1-3[25]	Java
PK4[25]	Sumatra
PK5[25]	Netherlands Borneo
PK6[25]	Celebe & Molucca Is
UN1[26]	Karelo-Finnish Rep
VO[27]	Newfoundland, Labrador
VQ1,5H1[28]	Zanzibar
VQ6[29]	British Somaliland
VQ9[30]	Aldabra
VQ9[30]	Desroches
VQ9[30]	Farquhar
VS2,9M2[3]	Malaya
VS4[31]	Sarawak
VS9H[32]	Kuria Muria Is
ZC5[31]	British North Borneo
ZC6,4X1[33]	Palestine
ZD4[34]	Gold Coast, Togoland
1M[1,35]	Minerva Reef
7O/VS9K[26]	Kamaran Is
8Z4[37]	Saudi Arabia/Iraq Neutral Zone
8Z5,9K3[38]	Kuwait/Saudi Arabia Neutral Zone
9S4[39]	Saar
9U5[40]	Ruanda-Urundi
[41]	Blenheim Reef
[42]	Geyser Reef

Notes

1 Unofficial prefix.
2 (AC3) Only contacts made April 30, 1975 and before count for this country. Contacts made May 1, 1975 and after, count as India (VU).
3 (AC4) Only contacts made May 30, 1974 and before, count for this country. Contacts made May 31, 1974 and after count as China (BY).
4 (C9) Only contacts made September 15, 1963 and before, count for this country. Contacts made September 16, 1963 and after count as China (BY).
5 (CN2) Only contacts made June 30, 1960 and before, count for this country. Contacts made July 1, 1960 and after count as Morocco (CN).
6 (CR8) Only contacts made December 31, 1962 and before, count for this country.
7 (CR8, CR10) Only contacts made September 14, 1976 and before, count for this country.
8 (DA-DM) Only contacts made September 16, 1973 and before, count for this country. Contacts made September 17, 1973 and after, count as either FRG (DA-DL) or GDR (Y2-Y9).
9 (EA9) Only contacts made May 13, 1969 and before, count for this country.
10 (ET2) Only contacts made November 14, 1962 and before, count for this country. Contacts made November 15, 1962 and after, count as Ethiopia (ET).
11 (FF) Only contacts made August 6, 1960 and before, count for this country.
12 (FH, FB8) Only contacts made July 5, 1975 and before, count for this country. Contacts made July 6, 1975 and after, count as Comoros (D6) or Mayotte (FH).
13 (F18) Only contacts made December 20, 1950 and before, count for this country.
14 (FN8) Only contacts made December 31, 1954 and before, count for this country.
15 (FQ8) Only contacts made August 16, 1960 and before, count for this country.
16 (HKØ,KP3,KS4) Only contacts made September 16, 1981 and before, count for this country. Contacts made September 17, 1981 and after, count as San Andres (HKØ).
17 (I1) Only contacts made March 31, 1957 and before, count for this country. Contacts made April 1, 1957 and after, count as Italy (I).
18 (I5) Only contacts made June 30, 1960 and before, count for this country.
19 (JD1/7J1) Only contacts made May 30, 1976 to November 30, 1980 count for this country. Contacts made December 1, 1980 and after, count as Ogasawara (JD1).
20 (JZØ) Only contacts made April 30, 1963 and before, count for this country.
21 (KR6,9,JR6,KA6) Only contacts made May 14, 1972 and before, count for this country. Contacts made May 15, 1972 and after, count as Japan (JA).
22 (KS4) Only contacts made August 31, 1972 and before, count for this country. Contacts made September 1, 1972 and after, count as Honduras (HR)
23 (KZ5) Only contacts made September 30, 1979 and before, count for this country.
24 (P2,VK9) Only contacts made September 15, 1975 and before, count for this country. Contacts made September 16, 1975 and after, count as Papua New Guinea (P2).
25 (PK1-6) Only contacts made April 30, 1963 and before, count for this country. Contacts made May 1, 1963 and after, count as Indonesia (YB).
26 (UN1) Only contacts made June 30, 1960 and before, count for this country. Contacts made July 1, 1960 and after, count as European RSFSR (UA).
27 (VO) Only contacts made March 31, 1949 and before, count for this country. Contacts made April 1, 1949 and after, count as Canada (VE).
28 (VQ1,5H1) Only contacts made May 31, 1974 and before, count for this country. Contacts made June 1, 1974 and after, count as Tanzania (5H).
29 (VQ6) Only contacts made June 30, 1960 and before, count for this country.
30 (VQ9) Only contacts made June 28, 1976 and before, count for this country. Contacts made June 29, 1976 and after, count as Seychelles (S7).
31 (VS2, VS4, ZC5, 9M2) Only contacts made September 15, 1963 and before, count for this country.

Contacts made September 16, 1963 and after, count as West Malaysia (9M2) or East Malaysia (9M6,8).
32 (VS9H) Only contacts made November 29, 1967 and before, count for this country.
33 ((ZC6,4X1) Only contacts made June 30, 1968 and before, count for this country. Contacts made July 1, 1968 and after, count as Israel (4X).
34 (ZD4) Only contacts made March 5, 1957 and before, count for this country.
35 (1M) Only contacts made July 15, 1972 and before, count for this country. Contacts made July 16, 1972 and after, count as Tonga (A3).
36 (7O/VS9K) Only contacts made March 10, 1982 and before, count for this country.
37 (8Z4) Only contacts made December 25, 1981 and before, count for this country.
38 (8Z5,9K3) Only contacts made December 14 and before, count for this country.
39 (9S4) Only contacts made MARCH 31, 1957 and before, count for this country.
40 (9U5) Only contacts made July 1, 1960 to June 30, 1962, count for this country. Contacts made July 1, 1962 and after, count as Burundi (9U) or Rwanda (9X).
41 (Blenheim Reef) Only contacts made May 4, 1967 to June 30, 1975, count for this country. Contacts made July 1, 1975 and after, count as Chagos (VQ9).
42 (Geyser Reef) Only contacts made May 4, 1967 to February 28 1978 count for this country.

Prefix Cross References

A8 = EL
AC (before 1972) = A5
AH = KH
AL7 = KL7
AM-AO = EA
AT-AW = VU
AX = VK
AY-AZ = LU
CF-CK = VE
CL = CO
CQ-CS = CT
CR3 (before 1974) = J5
CR4 (before 1976) = D4
CR5 (before 1976) = S9
CR6 (before 1976) = D2
CR7 (before 1976) =C9
CR9 (before 1985) = XX9
CT2 (before 1986) = CU
CXØ = CE9/VP8
CY-CZ = VE
CY9 (before 1985) = CYØ
DM-DT (before 1980) = Y2-9
EAØ (before 1969) = 3C
EK, EM-EO, ER-ES, EU-EZ = U
FA-FF (after 1981) = F
FA (before 1963) = 7X
FB8 (before 1961) = 5R
FB8 (before 1985) = FT
FC (before 1985) = TK
FD8 (before 1961 = 5V
FE8 (before 1961) = TJ
FL (before 1978) = J2
FU8 (before 1982 = YJ
GB = G
GC (before 1977) = GJ/GU
H2 = 5B
H3 = HP
H5 (Bophutatswana) = ZS
H7 = YN
HE = HB
HM (before 1982) = HL
HT = YN
HU = YS
HW-HY = F
J4 = SV
KA1 = JD1
KA2AA-KA8ZZ = JA
KB6 (before 1979) = KH1
KC4 (Navassa) = KP1
KG6 (before 1979) = KH2
KG6I (before 1970) = JD1
KG6R,S,T (before 1979) = KHØ
KJ6 (before 1979) = KH3
KM6 (before 1979) = KH4
KP4 (Desecheo) = KP5
KP6 (before 1979) = KH5
KS6 (before 1979) = KH8
KV4 (before 1979) = KP2
KW6 (before 1979) = KH9
L2-9 = LU
LY = UP
M1 (before 1984) = T7
MP4B (before 1972) = A9
MP4M (before 1972) = A4
MP4Q (before 1972) = A7
MP4T,D (before 1972) = A6
NH = KH
NL7 = KL7
NP = KP
OQ (before 1961) = 9Q
PR (before 1986) = PJ
PX (before 1970) = C3
RA,RN = UA
RB-RR = UB-UR
RS-RZ = U
S4 (Ciskei) = ZS
S8 (Transekei) = ZS
T4 = CO
T4 (Venda) = ZS
TH,TM,TO-TQ,TV-TX = F
UN,UV,UW,UZ = UA
V9 (Venda) = ZS
VA-VG = VE
VH-VN = VK
VK9 (Nauru) = C2
VP1 (before 1982) = V3
VP2A (before 1982) = V2
VP2D (before 1979) = J7
VP2G (before 1975) = J3
VP2K (before 1984) = V4 or VPW3
VP2L (before 1980) = J6
VP2S (before 1980) = J8
VP3 (before 1967) = 8R
VP4 (before 1963) = 9Y
VP5 (Jamaica) = 6Y
VP6 (before 1967) = 8P
VP7 (before 1974) = 8P
VQ2 (before 1965) = 9J
CQ4 (before 1964) = 5Z
VQ5 (before 1963) = 5X
VQ8 (before 1969) = 3B
VQ8 (Chagos) = VQ9
VQ9 (Seychelles) = S7
VR1 (before 1980) = T3/31
VR2 (before 1971) = 3D2
VR3 (before 1980) =T32
VR4 (before 1979) = H4
VR5 (before 1971) = A3
VR8 (before 1979) = T2
VS1 (before 1966) = 9V
VS5 (before 1985) = V8
VS7 (before 1949) = 4S
VS9A,P,S (before 1968) = 7O
VS9M = 8Q
VS9O (before 1961) = A4
VX-VY = CY/VE
WH = KH
WL7 = KL7
WP = KP
XJ-XO = VE
XP = OX
XQ-XR = CE
XV = 3W
XX7 (before 1976) = C9
YL = UO
ZB1 (before 1965) = 9H
ZD1 (before 1962) = 9L
ZD2 (before 1961) = 5N
ZD3 (before 1966) = C5
ZD4 (before 1958) = 9G
ZD5 (before 1969) = 3D6
ZD6 (before 1965) = 7Q
ZE (before 1981) = Z2-9
ZK9 (1983) = ZK2
ZM6 (before 1963) = 5W
ZM7 (before 1984) = ZK3
ZS7 (before 1969) = 3D6
ZS8 (before 1967) = 7P
ZS9 (before 1967) = A2
ZV-ZZ = PY
3B=3C (before 1968) = VE
3G = CE
3Z = SP
4A-4C = XE
4D-RI = DU
4J-4L = U
4M = YV
4N-4Q = YU
4T - OA
4U1VIC = OE
4V = HH
5J-5K = HK
5L-5M = EL
6C = YK
6D-6J = XE
6O = T5
6T-6U = ST
7A-7I = YB
7G (before 1967) = 3X
7J-7N = JA,JD
7S = SM
7Z = HZ
8A-8I = YB
8J-8N = JA
8O = A2
8S = SM
9A (before 1984) = T7
9B-9D = EP
9E=9F = ET

Allocation of International Call Signs

Call Sign	Allocated To
AAA-ALZ	United States of America
AMA-AOZ	Spain
APA-ASZ	Pakistan (Islamic Rep of)
ATA-AWZ	India (Rep of)
AXA-AXZ	Australia
AYA-AZZ	Argentine Republic
A2A-A2Z	Botswana (Rep of)
A3A-A3Z	Tonga (Kingdom of)
A4A-A4Z	Oman (Sultanate of)
A5A-A5Z	Bhutan (Kingdom of)
A6A-A6Z	United Arab Emirates
A7A-A7Z	Qatar (State of)
A8A-A8Z	Liberia (Rep of)
A9A-A9Z	Bahrain (State of)
BAA-BZZ	China (People's Rep of)
CAA-CEZ	Chile
CFA-CKZ	Canada
CLA-CMZ	Cuba
CNA-CNZ	Morocco (Kingdom of)
COA-COZ	Cuba
CPA-CPZ	Bolivia (Rep of)
CQA-CUZ	Portugal
CVA-CXS	Uruguay (Oriental Rep of)
CYA-CZZ	Canada
C2A-C2Z	Nauru (Rep of)
C3A-C3Z	Andorra (Principality of)
C4A-C4Z	Cyprus (Rep of)
C5A-C5Z	Gambia (Rep of the)
C6A-C6Z	Bahamas (C'wealth of the)
C7A-C7Z*	World Meteorological Org
C8A-C9Z	Mozambique (People's Rep of)
DAA-DRZ	Germany (Fed Rep of)
DSA-DTZ	Republic of Korea
DUA-DZZ	Philippines (Rep of the)
D2A-D2Z	Angola (People's Rep of)
D4A-D4Z	Cape Verde (Rep of)
D5A-D5Z	Liberia (Rep of)
D6A-D6Z	Comoros (Fed & Islamic Rep of the)
D7A-D9Z	Republic of Korea
EAA-EHZ	Spain
EIA-EJZ	Ireland
EKA-EKZ	Union of Soviet Socalist Republics

ELA-ELZ	Liberia (Rep of)
EMA-EOZ	Union of Soviet Socialist Republics
EPA-EQZ	Iran (Islamic Rep of)
ERA-ESZ	Union of Soviet Socialist Republics
ETA-ETZ	Ethiopia
EUA-EWZ	Byelorussian Soviet Soc Republic
EXA-EZZ	Union of Soviet Socialist Republics
FAA-FZZ	France
GAA-GZZ	United Kingdom of Great Britain & Northern Ireland
HAA-HAZ	Hungarian People's Republic
HBA-HBZ	Switzerland (Confederation of)
HCA-HDZ	Ecuador
HEA-HEZ	Switzerland (Confederation of)
HFA-HFZ	Poland (People's Rep of)
HGA-HGZ	Hungarian People's Republic
HHA-HHZ	Haiti (Rep of)
HIA-HIZ	Dominican Republic
HJA-HKZ	Colombia (Rep of)
HLA-HLZ	Republic of Korea
HMA-HMZ	Democratic People's Rep of Korea
HNA-HNZ	Iraq (Rep of)
HOA-HPZ	Panama (Rep of)
HQA-HRZ	Honduras (Rep of)
HSA-HSZ	Thailand
HTA-HTZ	Nicaragua
HUA-HUZ	El Salvadore (Rep of)
HVA-HVZ	Vatican City State
HWA-HYZ	France
HZA-HZZ	Saudi Arabia (Kingdom of)
H2A-H2Z	Cyprus (Rep of)
H3A-H3Z	Panama (Rep of)
H4A-H4Z	Solomon Islands
H6A-H7Z	Nicaragua
H8A-H9Z	Panama (Rep of)
IAA-IZZ	Italy
JAA-JSZ	Japan
JTA-JVZ	Mongolai People's Republic
JWA-JXZ	Norway
JYA-JYZ	Jordan (Hashemite Kingdom of)
JZA-JZZ	Indonesia (Rep of)
J2A-J2Z	Djibouti (Rep of)
J3A-J3Z	Grenada
J4A-J4Z	Greece
J5A-J5Z	Guinea-Bissau (Rep of)
J6A-J6Z	Saint Lucia
J7A-J7Z	DOminica
J8A-J8Z	St Vincent & the Grenadines
KAA-KZZ	United States of America
LAA-LNZ	Norway
LOA-LWZ	Argentina (Rep of)
LXA-LXZ	Luxembourg
LYA-LYZ	Union of Soviet Socialist Republics
LZA-LZZ	Bulgaria (People's Rep of)
L2A-L9Z	Argentina (Rep of)
MAA-MZZ	United Kingdom of Great Britain & Northern Ireland
NAA-NZZ	United States of America
OAA-OCZ	Peru
ODA-ODZ	Lebanon
OEA-OEZ	Austria
OFA-OJZ	FInalnd
OKA-OMZ	Czechoslovak Socialist Republic
ONA-OTZ	Belgium
QUA-OZZ	Denmark
PAA-PIZ	Netherlands (Kingdom of the)
PJA-PJZ	Netherlands Antilles
PKA-POZ	Indonesia (Rep of)
PPA-PYZ	Brazil (Federative Rep of)
PZA-PZZ	Suriname (Rep of)
P2A-P2Z	Papua New Guinea
P3A-P3Z	Cyprus (Rep of)
P4A-P4Z	Aruba
P5A-P9Z	Dem People's Republic of Korea
QAA-QZZ	(Service abbreviations)
RAA-RZZ	Union of Soviet Socialist Republics
SAA-SMZ	Sweden
SNA-SRZ	Poland (People's Rep of)
SSA-SSM	Egypt (Arab Rep of)
SSN-STZ	Sudan (Dem Rep of the)
SUA-SUZ	Egypt (Arab Rep of)
SVA-SZZ	Greece
S2A-S3Z	Bangladesh (People's Rep of)
S6A-S6Z	Singapore (Rep of)
S7A-S7Z	Seychelles (Rep of)
S9A-S9Z	Sao Tome & Principe (Dem Rep of)
TAA-TCZ	Turkey
TDA-TDZ	Guatemala (Rep of)
TEA-TEZ	Costa Rica
TFA-TFZ	Iceland
TGA-TGZ	Guatemala (Rep of)
THA-THZ	France
TIA-TIZ	Costa Rica
TJA-TJZ	Cameroon (United Rep of)
TKA-TKZ	France
TLA-TLZ	Central African Republic
TMA-TMZ	France
TNA-TNZ	Congo (People's Rep of the)
TOA-TQZ	France
TRA-TRZ	Gabon Republic
TSA-TSZ	Tunisia
TTA-TTZ	Chad (Rep of)
TUA-TUZ	Ivory Coast (Rep of the)
TVA-TXZ	France
TYA-TYZ	Benin (People's Rep of)
TZA-TZZ	Mali (Rep of)
T2A-T2Z	Tuvalu
T3A-T3Z	Kiribati Republic
T4A-T4Z	Cuba
T5A-T5Z	Somali Democratic Republic
T6A-T6Z	Afghanistan (Dem Rep of)
T7A-T7Z	San Marino (Rep of)
UAA-UQZ	Union of Soviet Socialist Republic
URA-UTZ	Ukrainian Soviet Socialist Republic
UUA-UZZ	Union of Soviet Socialist Republics
VAA-VGZ	Canada
VHA-VNZ	Australia
VOA-VOZ	Canada
VPA-VSZ	United Kingdom of Great Britain & Northern Ireland
VTA-VWZ	India (Rep of)
VXA-VYZ	Canada
VZA-VZZ	Australia
V2A-V2Z	Antigua & Barbuda
V3A-V3Z	Belize
V4A-V4Z	St Christopher & Nevis
V8A-V8Z	Brunei
WAA-WZZ	United States of America
XAA-XIZ	Mexico
XJA-XOZ	Canada
XPA-XPZ	Denmark
XQA-XRZ	Chile
XSA-XSZ	China (People's Rep of)
XTA-XTZ	Burkina Faso
XUA-XUZ	Democratic Kampuchea
XVA-XVZ	Vietnam (Socialist Rep of)
XWA-XWZ	Lao People's Democratic Republic
XXA-XXZ	Portugal
XYA-XZZ	Burma (Socialist Rep of the Union of)
YAA-YAZ	Afghanistan (Dem Rep of)
YBA-YHZ	Indonesia (Rep of)
YIA-YIZ	Iraq (Rep of)
YJA-YJZ	New Hebrides
YKA-YKZ	Syrian Arab Republic
YLA-YLZ	Union of Soviet Socialist Republics
YMA-YMZ	Turkey
YNA-YNZ	Nicaragua
YOA-YRZ	Romania (Socialist Rep of)
YSA-YSZ	El Salvadore (Rep of)
YTA-YUZ	Yugoslavia (Socialist Fed Rep of)
YVA-YYZ	Venezuela (Rep of)
YZA-YZZ	Yugoslavia (Socialist Fed Rep of)
Y2A-Y9Z	German Democratic Republic
ZAA-ZAZ	Albania (Socialist People's Rep of)
ZBA-ZJZ	United Kingdom of Great Britain & Northern Ireland
ZKA-ZMZ	New Zealand
ZNA-ZOZ	United Kingdom of Great Britain & Northern Ireland
ZPA-ZPZ	Paraguay (Rep of)
ZQA-ZQZ	United Kingdom of Great Britain & Northern Ireland
ZRA-ZUZ	South Africa (Rep of)
ZVA-ZZZ	Brazil (Federative Rep of)
Z2A-Z2Z	Zimbabwe (Rep of)
2AA-2ZZ	United kingdom of Great Britain & Northern Ireland
3AA-3AZ	Monaco
3BA-3BZ	Mauritius
3CA-3CZ	Equatorial Guinea (Rep of)
3DA-3DM	Swaziland (Kingdom of)
3DN-3DZ	FIji
3EA-3FZ	Panama (Rep of)
3GA-3GZ	Chile
3HA-3UZ	China (People's Rep of)
3VA-3VZ	Tunisia
3WA-3WZ	Vietnam (Socialist Rep of)
3XA-3XZ	Guinea (People's Revolutionary Rep of)
3YA-3YZ	Norway
3ZA-3ZZ	Poland (People's Rep of)
4AA-4CA	Mexico
4DA-4IZ	PHilippines (Rep of the)
4JA-4LZ	Union of Soviet Socialist Republics
4MA-4MZ	Venezuela (Rep of)
4NA-4OZ	Yugoslavia (Socialist Fed Rep of)
4PA-4SZ	Sri Lanka (Dem Socialist Rep of)
4TA-4TZ	Peru
4UA-4UZ*	United Nations Organisation
4VA-4VZ	Haiti (Rep of)
4WA-4WZ	Yemen Arab Republic
4XA-4XZ	Israel (State of)
4YA-4YZ*	International Civil Aviation Org
4ZA-4ZZ	Israel (State of)
5AA-5AZ	Libya (Socialist People's Libyan Arab Jamahiriya)
5BA-5BZ	Cyprus (Rep of)
5CA-5GC	Morocco (Kingdom of)
5HA-5IZ	Tanzania (United Rep of)
5JA-5KZ	Colombia (Rep of)
5LA-5MZ	Liberia (Rep of)
5NA-5OZ	Nigeria (Fed Rep of)
5PA-5QZ	Denmark
5RA-5SZ	Madagascar (Dem Rep of)
5TA-5TZ	Mauritania (Islamic Rep of)
5UA-5UZ	Niger (Rep of the)
5VA-5VZ	Togolese Republic
5WA-5WZ	Western Samoa
5XA-5XZ	Uganda (Rep of)
5YA-5ZZ	Kenya (Rep of)
6AA-6BZ	Egypt (Arab Rep of)
6CA-6CZ	Syrian Arab Republic
6DA-6JZ	Mexico
6KA-6NZ	Republic of Korea
6OA-6OZ	Somali Democratic Republic
6PA-6SZ	Pakistan (Islamic Rep of)
6TA-6UZ	Sudan (Dem Rep of the)
6VA-6WZ	Senegal (Rep of the)
6XA-6XZ	Madagascar (Dem Rep of)
6YA-6YZ	Jamaica
6ZA-6ZZ	Liberia (Rep of)
7AA-7IZ	Indonesia (Rep of)
7JA-7NZ	Japan
7OA-7OZ	Yemen (People's Dem Rep of)
7PA-7PZ	Lesotho (Kingdom of)
7QA-7A	Malawi (Rep of)
7RA-7RZ	Algeria (Algeria Dem & Popular Rep)
7SA-7SZ	Sweden
7TA-7YZ	Algeria (Algerian Dem & Popular Rep)
7ZA-7ZZ	Saudi Arabia (Kingdom of)
8AA-8IZ	Indonesia (Rep of)
8JA-8NZ	Japan
8OA-8OZ	Botswana (Rep of)
8PA-8PZ	Barbados
8QA-8QZ	Maldives (Rep of)
8RA-8RZ	Guyana
8SA-8SZ	Sweden
8TA-8YZ	India (Rep of)
8ZA-8ZZ	Saudi Arabia (Kingdom of)
9BA-9DZ	Iran (Islamic Rep of)
9EA-9FZ	Ethiopia
9GA-9GZ	Ghana
9HA-9HZ	Malta (Rep of)
9IA-9JZ	Zambia (Rep of)
9KA-9KZ	Kuwait (State of)
9LA-9LZ	Sierra Leone
9MA-9MZ	Malaysia
9NA-9NZ	Nepal
9OA-9TZ	Zaire (Rep of)
9UA-9UZ	Burundi (Rep of)
9VA-9VZ	Singapore (Rep of)
9WA-9WZ	Malaysia
9XA-9XZ	Rwanda (Rep of)
9YA-9ZZ	Trinidad & Tobago

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Australian VHF, UHF and SHF records

Correct as at 1-1-90
Legend
* – Australian record # New record since last edition

1. Home/Portable Category

Australian Capital Territory

50 MHz	No claim				
144 MHz	VK1RH	to	VK1ZJR	1/03/87	16.3 km

New South Wales

50 MHz	VK2ASZ	to	VE1ASJ	6/04/81	16,654.4 km
144 MHz	VK2ZRU	to	VK6AOM	13/12/86	2,697.9 km
432 MHz	VK2ZAB	to	ZL1AKW	13/01/88	2,299.8 km
576 MHz	VK4ZRF/2	to	VK4ZSH/4	11/12/81	255.4 km
1,296 MHz	VK2BDN	to	ZL1AVZ	9/12/82	2,132.7 km
2,300 MHz	VK2ZAC/2	to	VK2BDN/2	19/05/73	159.9 km
3,300 MHz	VK2AHC/2	to	VK2SB/2	16/01/77	114.1 km
5,650 MHz	VK2AHC/2	to	VK2SB/2ZND/2	12/04/75	114.1 km
10,000 MHz	VK2AHC/2	to	VK2SB/2ZND/2	12/04/75	114.1 km

Victoria

50MHz	VK3OT	to	VP2VGR	17/03/81	16,663.3 km
144MHz	VK3YLR/3	to	VK6KZ/6	23/01/80	2,784.4 km
432MHz *	VK3ZBJ	to	VK6KZ/6	23/01/80	2,715.9 km
576MHz *#	VK3ZBJ	to	VK3KAJ/5	25/2/89	382.9 km
1,296MHz	*VK3ZBJ	to	VK6WG	18/03/88	2,449.3 km
2,300MHz	VK3ZHP	to	VK7HL	12/01/85	427.3 km
3,300MHz	VK3KAJ/3	to	VK3ZBJ	25/01/86	244.3 km
5,650MHz	No claim				
10,000MHz *	VK3KAJ/3	to	VK3ZBJ/3	8/02/86	252.1 km

Queensland

50MHz	VK4AYX	to	DL3ZM/YV5	18/03/81	15,582 km
144MHz *	VK4ZSH/4	to	JA7OXL	24/04/83	6,616.9 km
432MHz	VK4LC	to	ZL3TAL	24/11/82	2,283.4 km
576MHz	VK4ZRF/4	to	VK4ZSH/4	7/12/81	377.6 km
1,296MHz	AX4NO/4	to	AX4ZT/2	12/04/70	402 km
2,300MHz	No claim				
3,300MHz	No claim				
5,650 MHz	No claim				
10,000 MHz	VK4ZNC/4	to	VK4ZSH/4	9/11/81	170.6 km

South Australia

50MHz	VK5KK	to	XE1GE	9/04/79	14,078 km
144MHz	VK5ZEE	to	ZL1HH	15/01/86	3,458.8 km
432MHz	VK5NY	to	VK7JG	21/05/85	995.0 km
576MHz *	VK3KAJ/5	to	VK3ZBJ	25/2/89	382.9 km
1,296MHz *#	VK5MC	to	VK6KZ/6	23/01/80	2,289.4 km
2,300MHz *	VK5QR	to	VK6WG	17/02/78	1,885.5 km
3,300MHz *	VK5QR	to	VK6WG	25/01/86	1,885.5 km
5,650MHz *#	VK5NT	to	VK5ZO/P	12/11/89	176.4 km
10,000MHz	VK5CU/5	to	VK5MW/5	30/12/71	95.7 km

Western Australia

50MHz *	VK6BE	to	JA8BP	30/10/58	8,833 km
144MHz	VK6KZ/6	to	VK3YLR/3	23/01/80	2,784.2 km
432MHz *	VK6KZ/6	to	VK3ZBJ	23/01/80	2,715.9 km
576MHz	VK6KZ/6	to	VK6HK	16/01/83	196.4 km
1,296MHz *	VK6WG	to	VK3ZBJ	18/03/88	2,449.3 km
2,300MHz *	VK6WG	to	VK5QR	17/02/78	1,885.5 km
3,300MHz *	VK6WG	to	VK5QR	25/01/86	1,885.5 km

Tasmania

50MHz	VK7JG	to	W5FF	17/04/82	13,765 km
144MHz	VK7ZAH	to	VK4ZAZ	1/01/67	1,910 km
432MHz	VK7JG	to	VK5NY	21/05/86	995.0 km
1,296MHz	VK7AH	to	VK3AKC	17/02/71	439 km
2,300MHz	VK7HL	to	VK3ZHP	12/01/85	427.3 km

Northern Territory

50MHz *	VK8GB	to	9Y4LL	10/04/82	18,665.4 km
144MHz	VK4ZSH/8	to	JA7OXL	24/10/82	6,460.9 km

2. EME Category

144MHz	VK3ATN	to	K2MWA/2	28/11/66	16,761 km
432MHz	VK6ZT	to	K2UYH	29/01/83	18,726.4 km
1,296MHz	VK3AKC	to	W2NFA	6/10/73	16,713 km

3. ATV Category

432MHz	VK7EM/T	to	VK3ZPA/T	13/12/72	413 km

4. Mobile Category

144MHz	VK3KAJ/M	to	VK6BE	25/1/86	2,224.5 km
432MHz	VK3KAJ/M	to	VK6BE	25/1/86	2,224.5 km
576MHz *#	VK3KAJ/M	to	VK3ZBJ	26/2/89	122.5 km
1296MHz *#	VK3ZJC/M	to	VK3KKW/M	16/9/89	137.6 km

5. Digital Modes Category

52MHz *#	VK3ZJC	to	VK8ZLX	26/12/88	1906.3 km

Stolen Equipment Register

The Stolen Equipment Register is one of many services offered to members by the Wireless Institute of Australia. It has now been in operation since 1980, and is maintained on a computer database in the Federal Office. At regular intervals, updates of the complete list, sorted into categories of: Equipment Manufacturer/Model, Owner, Date Stolen are distributed to each Division. Members wanting to take advantage of this register, either to publicise the theft of their equipment, or to check equipment they are about to purchase, may contact their Division, or write or telephone the Executive Office.

Any telephone reports of stolen equipment must be followed immediately with written confirmation of the details. For maximum efficiency, these details should include: Manufacturer's name, Model, Type of equipment, Serial number, Date stolen, Owner's name, address and call sign, Any distinguishing features or modifications, Police contact (if any). When equipment is recovered, it is important that you advise the Executive Office as soon as practicable. This list is the most up-to-date information we have at the time of going to press, but is based entirely on information received from you, the member.Would all readers please check this list and immediately advise if there are any amendments required.

WIA DATABASE LIST OF UNRECOVERED STOLEN EQUIPMENT AS AT 6 Jan 1990

*Manufacturer	Model	Description	Serial No	Owner	Stolen	Recovered	Published Comment
AZDEN	PCS-3000	2M FM MOBILE	36738	VK2KCV	01-Jun-87	-	NO MICROPHONE - NO BRACKET
DICK SMITH	AUDIO	GENERATOR		VK2XJC	15-May-85	01-Aug-85	-
DICK SMITH	EXPLORER	70CM FM TRANSCEIVER		VK2KUR	24-Sep-84 -	01-Jan-85	EXTENSIVE MODIFICATIONS
DRESSLER	EVV2000	2M PRE-AMP	1027	VK2XJC	15-May-85 -	01-Aug-85	-
ELECTROPHONE	TX470T	UHF TRANSCEIVER	50600672	VK6ZPL	11-Apr-87 -	-	-
EMTRONICS	NOISE BRIDGE		EM342	VK4AAE	27-Oct-89 -	-	-
GALAXY	5		5672V2118	VK3UB	06-Jun-87 -	-	REMOTE VFO
GALAXY	5		5503V1309	VK3UB	06-Jun-87 -	-	REMOTE VFO
ICOM	IC02A	2M FM HANDHELD	23186	VK2FZH	09-Jun-89 -	01-Aug-89	WITH BP3 AND BC25E
ICOM	IC202		41013616	VK3ZBI	01-Oct-85 -	01-Mar-87	-
ICOM	IC202		03482	VK3ZJY	11-Aug-87 -	01-Oct-87	-
ICOM	IC202		5144	VK4ZSH	03-Sep-85 -	01-Nov-85	-
ICOM	IC211	2M M/MODE T/CEIVER	6804309	VK3BRV	17-Oct-84 -	01-Jan-85	-
ICOM	IC215	2M FM PORT T/CEIVER	05156	VK2AMX	20-Nov-84 -	01-Mar-85	-
ICOM	IC22		12266	VK3BLC	29-Apr-85 -	01-Jul-85	-
ICOM	IC22A		3402112	VK2ZIG	01-Jul-87 -	-	-
ICOM	IC22A		1914	VK4ZSH	03-Sep-85 -	01-Nov-85	-
ICOM	IC22A		8853	VK3ZU	03-May-84 -	01-Jul-84	-
ICOM	IC22A	2M FM TRANSCEIVER	FALLEN OFF	VK3YV	21-Aug-87 -	-	EARLY MODEL - 22 CHANNELS
ICOM	IC22S		62014533	VK3KAW	23-Dec-85 -	01-Mar-87	-
ICOM	IC22S	2M TRANSCEIVER	11912	VK2ETJ	06-Mar-88 -	-	PRE-AMP, SOCKET
ICOM	IC22S		14727	VK3ME	14-Aug-85 -	01-Nov-85	-
ICOM	IC22S	2M FM TRANSCEIVER	I5674	VK2CIB	11-Feb-89 -	-	-
ICOM	IC22S		14957	VK3DYZ	11-Sep-84 -	01-Nov-84	-
ICOM	IC22S	VHF FM TRANSCEIVER	07570	VK3KJA	14-Dec-87 -	-	DIGITAL READOUT
ICOM	IC25A	2M FM TRANSCEIVER	03831	VK2DPM	04-Nov-84 -	01-Jan-85	VFO MODIFIED
ICOM	C280	TRANSCEIVER	02592	VK2BVW	30-Mar-88 -	-	-
ICOM	IC290H		17701965	VK3ZBI	01-Oct-85 -	01-Mar-87	-
ICOM	IC290H		17703342	EMTRONICS	17-Feb-86 -	01-Mar-86 -	
ICOM	IC2A		12213830	VK3YOD	02-Dec-83 -	01-Jul-84	SPARE BATTERY PACK

*Manufacturer	Model	Description	Serial No	Owner	Stolen	Recovered	Published Comment
ICOM	IC2A		12209700	VK2AHF	08-Sep-87 -	-	-
ICOM	IC2A	144 MHZ FM H/HELD	12213837	VK5ABY	22-Dec-88 -	01-Mar-89	-
ICOM	IC2A	2M H/HELD T/CEIVER	29901052	VK2CKD	05-Feb-86 -	01-Apr-86	-
ICOM	IC2A	2M FM HANDHELD	04484	VK1MX	21-Jan-85 -	01-Apr-85	VINYL CASE
ICOM	IC3200		01046	VK2CIM	02-Aug-87 -	-	-
ICOM	IC45A	70CM FM TRANSCEIVER	01876	VK2DPM	04-Nov-84 -	01-Jan-85	-
ICOM	IC45A		18351005	VK3KJC	22-Feb-84 -	01-Jul-84	MEMORY BACKUP UNIT
ICOM	IC490A	70 CM TRANSCEIVER	16101192	VK3BVO	01-Mar-83 -	01-Jul-84	-
ICOM	IC4E		18103021	VK3YOD	02-Dec-83 -	01-Jul-84	SPARE BATTERY PACK
ICOM	IC4E			VK2KZZ	16-Aug-87	-	- CALLSIGN ENGRAVED
ICOM	IC502		00618	VK3ZJY	11-Aug-87 -	01-Oct-87	-
ICOM	IC551		01273	VK4ZSH	03-Sep-85 -	01-Nov-85	INCLUDING FM, VOX
ICOM	IC551		9401253	VK3ZBI	01-Oct-85 -	01-Mar-87	-
ICOM	IC551D	6M TRANSCEIVER	99003878	VK3YSG	01-Jan-84 -	01-Jul-84	-
ICOM	IC701	TRANSCEIVER	8001039	VK2???	15-Feb-88 -	-	-
ICOM	IC701PS	POWER SUPPLY	7800978	VK2???	15-Feb-88 -	-	-
ICOM	IC720A		06242	VK4ZSH	03-Sep-85 -	01-Nov-85	-
ICOM	IC730		13806798	MELB UNIV	18-Sep-85 -	01-Nov-85	HOME BREW POWER SUPPLY
ICOM	IC735		36304455	EMTRONICS	17-Feb-86 -	01-Mar-86	-
ICOM	ICPS20	POWER SUPPLY	10101966	VK3YSG	01-Jan-84 -	01-Jul-84	-
KDK	2025 MK II	2M TRANSCEIVER		VK2ETJ	06-Mar-88 -	-	DEFUNCT FINAL
KDK	FM2025 MK	2 2M FM TRANSCEIVER	A5020	VK2AML	03-Jul-88 -	-	SHARPE MICROPHONE
KDK	MULTI 7	2M HANDHELD		VK2TJB	09-Feb-88 -	-	DRIVERS LICENCE NO. ENGRAVED
KENWOOD	AT180	ANTENNA TUNER	0020450	VK2???	11-Nov-87 -	- -	
KENWOOD	AT200	ANTENNA TUNER	820049	VK2DCB	16-Aug-84 -	01-Nov-84	-
KENWOOD	DG5	DIGITAL DISPLAY	730475	VK2DCB	16-Aug-84 -	01-Nov-84	-
KENWOOD	DM81	GRID DIP OSCILLATOR	4020163	VK2KLF	10-Aug-89 -	-	STENCILLED IN 20MM BRIGHT YELLOW
KENWOOD	MC-50	DESK MICROPHONE	N/A	VK5ABY	22-Dec-88 -	-	-
KENWOOD	MS1	MOBILE MOUNT	-	VK5BJA	30-May-89 -	-	-
KENWOOD	SP520	SPEAKER		VK2DCB	16-Aug-84 -	01-Nov-84	-
KENWOOD	TM221A	2M FM TRANSCEIVER	8110722	VK2CCD	09-Apr-88 -	-	-
KENWOOD	TM221A		8022541	VK3ZJY	11-Aug-87 -	01-Oct-87	-
KENWOOD	TR2400	2M FM HANDHELD	0061926	VK2PJ	20-Apr-85 -	01-Jul-85	CALLSIGN ENGRAVED
KENWOOD	TR2400		0061950	VK2DPM	28-Aug-84 -	01-Nov-84	-
KENWOOD	TR2500		3040009	VK2ZQC	29-May-85 -	01-Aug-85	MICROPHONE AND CHARGER
KENWOOD	TR2500		3033045	VK2DYW	18-Feb-87 -	-	-
KENWOOD	TR2600A	2 M HANDHELD	5060895	VK5BJA	30-May-89 -	01-Jul-89	INCLUDING RUBBER DUCK ANTENNA
KENWOOD	TR2600A	HANDHELD	7030631	VK5AAR	03-Oct-86 -	01-Mar-87	-
KENWOOD	TR2600A	2 M HANDHELD TCVER	5060934	VK2KLF	10-Aug-89 -	-	MISSING HAND STRAP
KENWOOD	TR7850	2M FM TRANSCEIVER	1111125	VK2CCK	07-Feb-86 -	01-Apr-86	-
KENWOOD	TR7850		202080	VK2DED	06-Mar-84 -	01-Mar-87	"N" CONNECTOR
KENWOOD	TR7850	2M FM H/HELD T/CEIVRM	2020561	VK2ALK	22-Oct-88 -	01-Jan-89	-
KENWOOD	TR7950		4010747	VK2TVG	08-Aug-85 -	01-Nov-85	-
KENWOOD	TR9000	2M TRANSCEIVER	1050780	VK3YSG	01-Jan-84 -	01-Jul-84	-
KENWOOD	TR9000		1020527	VK2KAH	03-Jan-87 -	01-Mar-87	ADDITIONAL MEMORY SWITCH
KENWOOD	TS120S	TRANSCEIVER	950819	VK2???	11-Nov-87 -	-	-
KENWOOD	TS120V		0081224600	VK2VWN	03-May-85 -	01-Jul-85	MT35 MICROPHONE
KENWOOD	TS130S	TRANSCEIVER	40401C8	VK2BVW	30-Mar-88 -	-	-
KENWOOD	TS130S	HF SSB TRANSCEIVER	1090168	VK5ABY	22-Dec-88 -	01-Mar-89	-
KENWOOD	TS130SE		2060697	VK2KAH	03-Jan-87 -	01-Mar-87	-
KENWOOD	TS430S		4010322	VK2XJC	15-May-85 -	01-Aug-85	INCLUDING FM, FILTER
KENWOOD	TS440S	HF TRANSCEIVER	7090271	VK2FIT	24-Oct-89 -	-	WITH PS50 PSU & MC85 DESK MIC
KENWOOD	TS520S		820972	VK2DCB	16-Aug-84 -	01-Nov-84	-
KENWOOD	TS520S	HF TRANSCEIVER	?	VK2FZH	09-Jun-89 -	01-Aug-89	STICKER FROM "TURKEY RADIO"
KENWOOD	TS700A		350409	VK3ZJY	11-Aug-87 -	01-Oct-87	-
KENWOOD	TS930S		3050176	VK7JG	13-Jan-83 -	01-Jul-84	-
KENWOOD	VFO520	EXTERNAL VFO		VK2DCB	16-Aug-84 -	01-Nov-84	-
KYOTO	FM144-10	2M FM TRANSCEIVER	5027	VK2KUR	24-Sep-84 -	01-Jan-85	CALLSIGN ENGRAVED
LEADER	LSG11	SIGNAL GENERATOR	0041244	VK3KJA	14-Dec-87 -	-	-
LEADER	LSG16	SIGNAL GENERATOR	1081098	VK3YSG	01-Jan-84 -	01-Jul-84	MISC BITS ALSO
MIRAGE	B1016	2M 160W PWR AMP	550779	VK3KAW	23-Dec-85 -	01-Mar-87	-
REALISTIC	AX190	HF RECEIVER	500111	VK3KJA	14-Dec-87 -	-	-
REALISTIC	SP190	SPEAKER ENCLOSURE	20-5191	VK3KJA	14-Dec-87 -	-	-
REGENCY	HX2000	HANDHELD		DSE VIC	13-May-85 -	01-Aug-85	-
SAIKO	SC7000	SCANNER		VK2XJC	15-May-85 -	01-Aug-85	BNC ANTENNA SOCKET
SONY	2001D	COMMUNICATIONS RECVR?		VK2FZH	09-Jun-89 -	01-Aug-89	BROKEN ANTENNA
TELEQUIP'T	551	OSCILLOSCOPE		VK4AAE	27-Oct-89 -	-	-
TEMPO	1S	2M HANDHELD	012240	VK3UB	06-Jun-87 -	-	-
THORN	B&W TV		107512	VK2XJC	15-May-85 -	01-Aug-85	MOD FOR COMPUTER
TOKYO	HL160V	2M POWER AMPLIFIER	829331	VK2XJC	15-May-85 -	01-Aug-85	-
TOKYO	HL86V	6M POWER AMPLIFIER	819595	VK2XJC	15-May-85 -	01-Aug-85	-
TOKYO	HL90U	70CM POWER AMP	8304246	VK2XJC	15-May-85 -	01-Aug-85	-
TRIO	CS1560A2	CRO	10-20171	VK3YSG	01-Jan-84 -	01-Jul-84	-
UNIDEN	2020		50806009	VK2KSY	16-Sep-85 -	01-Nov-85	-
WELZ	SP200	SWR/PWR METER	600384	VK2XJC	15-May-85 -	01-Aug-85	-
YAESU	FAS14R	REMOTE ANT SEL	140138	VK3KJA	14-Dec-87 -	-	-
YAESU	FC707	ANTENNA TUNER	11140765	VK3DHV	01-Jun-87 -	-	-
YAESU	FC707	ANTENNA TUNER	11140775	VK2DBB	28-Apr-86 -	01-Jul-86	-
YAESU	FC707	ANTENNA TUNER	1N180265	VK4AAE	27-Oct-89 -	-	-
YAESU	FL2010	2M LINEAR AMPLIFIER	1L031300	VK3DKO	25-Aug-88 -	-	MOUNTED IN CRADLE
YAESU	FP707	12V 20 AMP P/SUPPLY	1H120548	VK5ABY	22-Dec-88 -	01-Mar-89	-
YAESU	FP707	POWER SUPPLY	4C050487	VK4AAE	27-Oct-89 -	-	-
YAESU	FRA7700	ACTIVE ANTENNA	2H050293	VK2???	11-Nov-87 -	-	-
YAESU	FRG7		299L26099	VK3ZLY	28-Jul-83 -	01-Jul-84	-
YAESU	FRG7700	RECEIVER	3M260983	VK2XPU	01-Aug-89 -	-	-
YAESU	FRG7700	RECEIVER	2K210752	VK2???	11-Nov-87 -	-	-

YAESU	FRT7700	ANTENNA TUNER	2K070479	VK2???	11-Nov-87 -	-	-
YAESU	FT101B	HF TRANSCEIVER	83L102373	VK3KJA	14-Dec-87 -	-	-
YAESU	FT101E	HF TRANSCEIVER	8G350283	VK2SS	29-Jun-84 -	01-Nov-84	-
YAESU	FT101E	HF TRANSCEIVER	7K/301042	VK5EZ	08-Jul-89 -	01-Sep-89	-
YAESU	FT101E	HF TRANSCEIVER	8L370414	VK3DYZ	11-Sep-84 -	01-Nov-84	-
YAESU	FT107M	HF TRANSCEIVER	1I110012	VK2ALN	03-Mar-87 -	-	-
YAESU	FT200	HF TRANSCEIVER	2K332252	VK3DYZ	11-Sep-84 -	01-Nov-84	-
YAESU	FT207R	2M HANDHELD	1D132704	VK2ETJ	06-Mar-88 -	-	-
YAESU	FT207R	2M FM HANDHELD	10132725	VK2EMC	04-Mar-85 -	01-May-85	BATTERY COVER MISSING
YAESU	FT208R	2M FM HANDHELD	4E382078	VK2PJ	29-Mar-89 -	01-Jun-89	FAULTY VCO
YAESU	FT208R		3N350964	VK2CBA	30-Jul-85 -	01-Mar-87	-
YAESU	FT209R		4L06245	DSE VIC	13-May-85 -	01-Aug-85	-
YAESU	FT209RH		4K050838	VK3CE	01-Jan-85 -	01-Mar-85	BLUE VINYL CASE
YAESU	FT209RH		5K190401	VK2HW	21-Feb-86 -	01-May-86	LEATHER CASE
YAESU	FT224		6G307290	VK3OV	28-May-87 -	-	-
YAESU	FT230			VK2EQD	18-Aug-87 -	-	-
YAESU	FT230R		4H081794	DSE VIC	13-May-85 -	01-Aug-85	-
YAESU	FT290R	2M FM TRANSCEIVER	2D100942	VK3DKO	25-Aug-88 -	-	CALLSIGN ENGRAVED
YAESU	FT290R	2M TRANSCEIVER	3C260713	VK2EGD	12-Nov-86 -	01-Feb-87	-
YAESU	FT290R		1L081321	VK3KJC	22-Feb-84 -	01-Jul-84	-
YAESU	FT290R	2M TRANSCEIVER	1M081340	VK2VE	04-Jan-87 -	01-Mar-87	OWNERS NAME
YAESU	FT290R	2M TRANSCEIVER	5G450016	VK7HW	18-Apr-88 -	-	MOBILE BRACKET
YAESU	FT290R		4E360554	VK3KGH	01-Jun-85 -	01-Aug-85	VINYL CASE
YAESU	FT290R	2M TRANSCEIVER	SF 280702	VK4AAE	27-Oct-89 -	-	COMPLETE WITH NICADS
YAESU	FT480R		1H12069	VK1ZUR	29-May-84 -	01-Jul-84	-
YAESU	FT620		010489	VK4ZSH	03-Sep-85 -	01-Nov-85	-

VIDEOTAPE LIBRARY

Now every Radio Club can provide their members with quality technical lectures on subjects covering the whole range of Amateur Radio activities by taking advantage of the WIA Federal Videotape Library. You'll find this a boon, particularly if yours is a country club which often has difficulty obtaining a variety of expert lecturers for its regular meetings. (Individual Amateurs and Librarians should take note of the Duplication Fees at the end of this.)

For Radio Clubs affiliated with the WIA it's inexpensive and easy.

Here's how it works...

For those titles for which the WIA does NOT hold a copy-right licence, all you have to do is...

Supply the Videotape Co-ordinator with a videocassette in a Video Cassette Box "Postpak", and Enclose Address and Stamps for return postage and the program is free for you to use in support of Amateur Radio in your area... including copying and transmission over the air if you wish.

Those programs which are copyright marked 'c' below, are available only ON LOAN.

To obtain any of them send with your request...

Information about your preferred VCR format,

A statement signed by a Responsible Officer of your Club that "I undertake that while (Program Title) is assigned to me, I will not allow it to be transmitted over the air, nor copied by any means whatsoever, and that I will return the same promptly after showing."

Enclose Address and Stamps for postage to you

The present "available formats" are as follows...

VHS - Size 200 x 110 x 30mm, Mass 350gr.

* Standard Play 4Hr max, or Long Play 8Hr max as requested.

* Standard Sound - "Dolby" On or Off as requested.

"Hi-Fi" FM Sound also present on all VHS cassettes.

BETA - Size 160 x 100 x 30mm, Mass 300gr.

Standard Play 3Hr 15min max only.

Standard Sound only (No "Dolby").

VIDEO 8 - Size 103 x 68 x 20mm, Mass 80gr.

* Standard Play 1 1/2Hr max, or Long Play 3Hr max as requested

"Hi-Fi" FM Sound is Standard (No "Dolby").

Obviously the smaller and lighter the cassette, the less the postage. * Note: Be sure to request Standard or Long Play, "Dolby" On or Off.

NOTE TO INDIVIDUAL AMATEURS: Since the inception of the WIA Federal Video Service, cassettes have been made freely available to all comers, especially to isolated Amateurs. However, recently there has been a rapid rise in the number of requests from individual Amateurs, some asking for over 10 hours of programs at a time.

Video duplication is a real-time, one-at-a-time operation for which the costs of maintenance of the equipment is not small. Obviously the Service is much more economical if (say) one tape is seen by 30 members of a club than if each of the 30 members were to request their own personal copy. Indeed, if EVERY member of the WIA requested just ONE program it would take about 4 YEARS at 40 hours a weeks to service!

So in an effort to encourage requests from Groups of Amateurs rather than Individuals, from now on a Duplication Fee of $2 per hour or part thereof will be payable in advance for all requests from Individual Amateurs. All such Fees will go towards upkeep of the duplication equipment.

NOTE TO LIBRARIANS: A number of Educational Institutions have already availed themselves of the technical lecture tapes from the WIA. While this service will continue to be available, from now on a Duplication Fee of $10 per hour or part thereof will be payable in advance by all Institutions not affiliated with the WIA. All such Fees will go towards the production costs of future Technical Lectures.

NOTE RE TAPE CASSETTE QUALITY: The WIA Videotape Co-ordinator retains the right to refuse to copy onto inferior quality video tape. In the past such tape has caused many hours of wasted time through clogged heads, and in future only reputable brands of video tape will be accepted. In particular, although not always in itself a guarantee of quality, use only those VHS cassettes which carry the official "VHS" logo.

WIA VIDEOTAPE PROGRAM TITLE LISTING as of 1/1/90

See Note	TITLE (in chronological order within each subject grouping)	Lecturer	Prod.	Approx Dur.	Col/ B&W	Year Prod	Description and/or Other Information
AMATEUR RADIO - HISTORIC INTEREST							
c	Wireless Telegraphy -circa 1910		? VK3ADW	10mins	B&W	1910	Archive material courtesy David Wardlaw
c	Amateur Radio (TV Pilot Program)		WIA NSW	30mins	B&W	1968	Archive material courtesy TEN channel 10
-	Opening of Burley Griffen Bldg - SA HQ		VK5KG	50mins	Colour	1977	Archive material
-	ATV in Australia 1978 - made for British ATV Club		VK5KG	30mins	Colour	1978	Archive material
-	ATV in United Kingdom 1978 - reply from BATC		G8CJS	30mins	Colour	1978	Archive material
-	History of ATV in South Australia		VK5KG	30mins	Colour	1980	Archive material, still building
-	Opening of Amateur Radio House - NSW HQ		VK2BDN & VK2ZQC	1' 42"	Colour	1983	Archive material
-	VK2 75th Aniv. Seminar Keynote Speeches		WIA NSW	2' 15"	Colour	1983	Dr. David Wardlaw & State Manager DOC
c	Heard Island Dxpeditions		ch 2,7,9,10	20mins	Colour	1984	Archive material; NO LOAN OR COPY AVAILABLE
-	Heard Island Dxpedition		VK2BCC WIA NSW	60mins	Colour	1986	Raw Unedited; from 1986 VK2 Seminar
AMATEUR RADIO - PROMOTIONAL							
o	The Ham's Wide World		ARRL	27mins	Colour	1969	Superseded by "The World of Amateur Radio"
-	This is Amateur Radio		ARRL	15mins	Colour	1970	Pitched at teenagers
-	Moving Up to Amateur Radio		ARRL	11mins	Colour	1975	Pitched at CBers
c	7J1RL DXpedition		JARL	60mins	Colour	1976	General Amateur Radio interest; LOAN ONLY
-	This Week has 7 Days looks into Amateur Radio		HSV7	25mins	Colour	1978	Pitched at teens; includes some ARRL footage
o	The World of Amateur Radio		ARRL	26mins	Colour	1978	Superseded by "The New World of Amateur Radio"
-	Amateur Radio - The National Resource of Every Nation		VK5KG	6mins	Colour	1979	Encapsulates AR; good for public exhibitions

THE GEORGE BUSH, MA
MIKHAIL GORBACHE

What has made Icom's range of transceivers world leaders in their class? Could it be the uncompromising standards of a George Bush? Is it the durability of a Maggie (Iron Lady) Thatcher? Or the innovative thinking of a Mikhail Gorbachev?

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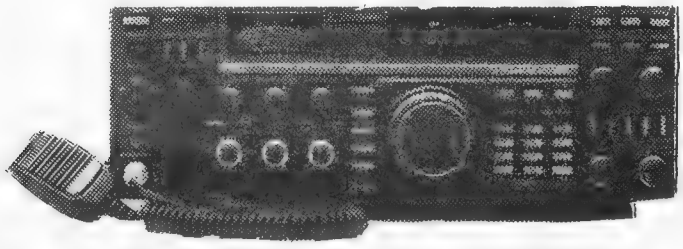
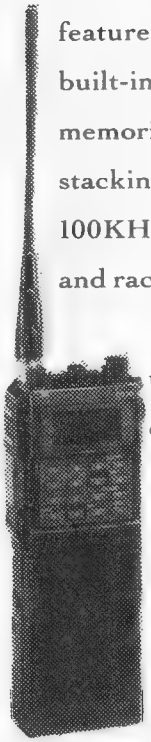
Which has led millions of radio users around the world to choose Icom. Their vote has made Icom the world leader of transceivers.

Announcing the IC-726. An advanced, HF/50MHz transceiver that combines VHF technology with the latest in sophistication. Designed for amateurs or veterans, and ideal for mobile users. 26 programmable memory channels, multi-mode transmitting and receiving and a host of other features and options.



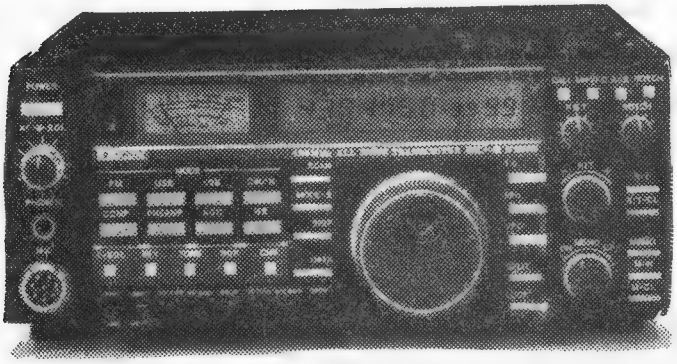
The Icom IC-765 HF transceiver features DDS synthesiser, high speed auto tuner, built-in AC power supply, 99 programmable memories, keyboard frequency entry, band stacking register, general coverage receiver 100KHz-30MHz, CI-V system for PC control and rack mounting dimensions.



The Icom IC-32AT dual band FM transceiver outputs 5.5W and has a full duplex crossband operation, on/off switchable power saver and 20 double-spaced memory channels that can store two frequencies. The programmed scan function scans all frequencies between two programmable frequencies. And Priority Watch monitors the Call Channel, a memory channel or all the memory channels in succession, every five seconds.

The Icom IC-228A (25W) and IC-228H (45W) mobile FM 144MHz transceivers are compact and easy to operate with 20 memory channels, multi-colour LCD programmed and memory scans, variable tuning steps, priority watch, main controls lit for night operation.

ARGARET THATCHER AND EV OF TRANSCEIVERS.

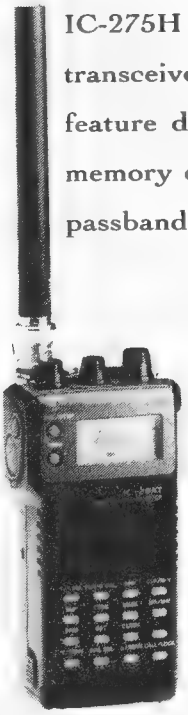


The Icom IC-475A (25W) and IC-475H (75W) 430 MHz All Mode transceivers are designed for packet mode with direct digital synthesizer (DDS), 99 memory channels, USB, LSB, CW, FM, passband tuning and adjustable IF notch filter.

The Icom IC-575A (10W) and IC-575H (100W) 28/50 MHz All Mode transceivers have a receiver coverage of 26-56 MHz and are equipped with direct digital synthesizer (DDS), 99 memory channels, and passband tuning.

The ICOM IC-4SA an amazing 70cm midget hand held. Comprising 48 memories plus 1 call channel, operating from batteries with 5 watts output at 13.8v or an external 12v DC supply. Auto power off function, scanning, scan skip, clock and time function, an optional pager and more.

The Icom IC-275A (25W) and IC-275H (100W) All Mode 144MHz transceivers are designed for packet mode and feature direct digital synthesizer (DDS), 99 memory channels, USB, LSB, CW, FM, and passband tuning.



The remarkable IC-2SAT is the ultimate in mini handheld high performance 2M FM transceivers. With convenient keyboard, re-chargeable batteries, 5W output (opt. with a 13.2v battery pack), 48 memories, a call channel and a variety of other sophisticated super multi functions. Plus 18 optional extras. Another marvellous break-through in miniaturized hand helds.

Call Melbourne on (03) 529 7582 or interstate on (008) 338 915 for your nearest Icom stockist. ICOM

ICO 0047

See Note	TITLE (in chronological order within each subject grouping)	Lecturer	Prod.	Approx Dur.	Col/ B&W	Year Prod	Description and/or Other Information
-	The New World of Amateur Radio		ARRL	28mins	Colour	1988	Supersedes "The World of Amateur Radio"
ANTENNAS							
c	G6CJ's Aerial Circus		G6CJ WIA	90mins	B&W	1977	THE Definitive Antenna Lecture; LOAN ONLY
-	Wire Antennas		VK5RG VK5KG	40mins	B&W	1978	Antennas for HF and Antenna Tuners
-	Loaded Wire Antennas		VK5NN VK5KG	50mins	Colour	1980	Using Inductive and Capacity loaded Antennas
w	Antennas and Directivity		VK2BBF OTC	73mins	Colour	1985	Lecture given to a group of Radio Amateurs
-	Antenna Rotator Systems		VK5AIM VK5KG	50mins	Colour	1986	Servicing the several different types
-	Broadband Antennas		VK5RG VK5KG	62mins	Colour	1986	Includes terminated antennas
ATV - ACTIVITY							
o	ATV in Australia 1980/81 - Made for British ATV Club		VK5KG	60mins	Colour	1980	Clips from ATV Groups in VKs 2,3,4,5 & 7
o	ATV in United Kingdom 1978/81		G8CJS	30mins	Colour	1981	Remake of their previous effort
o *	CQ ATV DX International 1983		WB2LLB	60mins	Colour	1983	ATV in USA and Europe
o	ATV in Victoria, 1984		VK3AHJ	54mins	Colour	1984	Courtesy of "The Roadshow Gang"
-	Hello from America! - Made for British ATV Club		WB0QCD	100min	Colour	1988	Clips from ATV Groups in the USA
ATV - GENERAL INTEREST							
-	Low Definition Television	Chris Long	VK5KG	25mins	Colour	1982	Re-creation of TV as transmitted by Baird
-	Model Aero-Nautical Mobile ATV		VK5GO VK5KG	6mins	Colour	1983	ATV camera & TX mounted in a model aeroplane
-	VK5RCN - Aust's first wind powered ATV rptr.		VK5KAU VK5KG VK5RCN	61mins	Colour	1986	A tour in and around
-	Australian TV History - The Untold Story	Chris Long	VK5KG	56mins	Colour	1988	Lecture to Radio Amateurs Old Timers Club
-	Australian TV History - Part 2	Chris Long	VK5KG	49mins	Colour	1988	Technical slides not used in the above
NEW	The Development of the TV Test Card	George Hersee	G8PTH	43mins	Colour	1988	Made for BATC by the BBC Training Dept
ATV- TECHNICAL							
o	The Signal to Noise Story		VK3ATY VK3AHJ	45mins	Colour	1982	Superseded by "UHF Pre-amplifiers" (below)
-	UHF Preamplifers		VK3ATY VK3AHJ	45mins	Colour	1983	Explanation and demo. of low noise preamps
-	Getting Started in Amateur Television		VK5KTV VK5KG	55mins	Colour	1983	How to set up an ATV station
-	Testing ATV Transmitters		VK5KG VK5KG	50mins	Colour	1983	How to correctly measure ATV systems
o *	High Definition TV Tutorial	Don Fink	WB2LLB	60mins	B&W	1983	A look at what is to come in Broadcast TV
o *	ATV Hamfest, York Pennsylvania, Sept.'83	Various	WB2LLB	6hrs	Colour	1983	Various ATV technical lectures from USA
COMPUTERS							
-	Demo. of VK5RTV's Micro-Computer Controller #1		VK5KG VK5KG	10mins	Colour	1979	First u-Computer controlled repeater in VK
o	Understanding Micro-Processors		VK5PE VK5KG	60mins	Colour	1980	A somewhat dated technical description
o	An ATV Hamshack Micro-Computer		VK3AHJ VK3AHJ	10mins	Colour	1981	Describes now unavailable microcomputer kit
-	Getting Started in Amateur Micro-Computers		VK5IF VK5KG	33mins	Colour	1983	Demo. of hard- & software for Amateur Radio
DATA TRANSMISSION							
-	Getting Started in Amateur RTTY		VK5JM VK5KG	85mins	Colour	1983	RTTY using teleprinters and Micro-Computers
-	Amateur Packet Radio		VK5AGR VK5KG	60mins	Colour	1984	Theory and Demonstration.
-	Packet Radio - 10 months on		VK2KYJ & VK2AAB WIA NSW	65mins	Colour	1985	Raw Unedited; from 75 aniv. VK2 Seminar
w	X25 Protocols and Packet Switching		VK2ZXB OTC	47mins	Colour	1986	Lecture given to a group of Radio Amateurs
MICROWAVE TECHNIQUES							
NEW	Introducing Microwaves	Des Clift	VK5ZO PJ Video	74mins	Colour	1988	"Nuts & Bolts" expert technical lecture
PROPAGATION							
-	Getting Started in Understanding the Ionosphere		VK5NX VK5ZBD	50mins	Colour	1983	How the Ionosphere aids HF communication
-	VHF Signal Enhancement by Aircraft		VK2ZAB WIA NSW	70mins	Colour	1986	Raw Unedited; from 1986 VK2 Seminar
SATELLITES							
o	Getting Started in Amateur Satellites		VK5HI & VK5AGR VK5KG	60mins	Colour	1983	Superseded (see below)
o	An Introduction to Amateur Satellites (Pt 1)		VK5AGR VK5KG	60mins	Colour	1984	An overview of Amateur Satellite working
o	Micro-Computer Aids to Satellite Tracking (Pt 2) "		VK5KG	30mins	Colour	1984	Programs for tracking & decoding telemetery
-	Using Phase III Amateur Satellites		VK5HI VK5KG	90mins	Colour	1984	History, construction & use of high orbit sats.
-	The Amsat Oscar Phase 3 Story	Dr. Karl Meinzer	DJ4ZC VK5KG	80mins	Colour	1985	"The Father of Oscar" includes film of launch.
-	Antennas for Satellites	Dr. Trevor Bird	WIA NSW	75mins	Colour	1986	Raw Unedited; from 1986 VK2 Seminar
SPACE GENERAL INTEREST							
-	Apollo 13 Disaster		VK5JM VK5KG	90mins	Colour	1980	Australian tracking procedure saved Apollo 13
o	SSTV Pictures from Space - Voyager		VK5KG	15mins	Colour	1983	SSTV pix converted from Saturn fly past
-	Aussat - Australia's Domestic Comms. Satellite		VK5JM VK5KG	62mins	Colour	1984	Technical description of services offered
-	Amateur Radio's Newest Frontier	ARRL	26mins		Colour	1985	Amateur Radio in Space; General P.R.
-	Working W5LFL in orbit from VK1ORR	Richard Elliot	23mins		Colour	1986	Raw Unedited actuality footage
MISCELLANEOUS							
-	An Auxiliary Battery Charger		VK5NX VK5KG	30mins	Colour	1981	Charging a second mobile battery
-	Lecture - Winning Foxhunts		VK5TV VK5KG	45mins	Colour	1981	How to do it from one who has!
-	Getting Started in Amateur Construction		VK5AIM VK5KG	50mins	Colour	1983	Mechanical hints for novice constructors
-	Comms. Consequences of Nuclear War	Dr. John Coulter	VK5ZBD	60mins	Colour	1983	Why your gear may not survive even if you do!
-	The Far Eastern Broadcasting Company		VK5KG	60mins	Colour	1984	How a Short Wave Broadcaster operates
-	The Aust. "Over the Horizon Radar"	Dr. Phil Whitham	VK5KG	60mins	Colour	1984	How the "Australian Woodpecker" works
-	What to Expect when the RI Calls!	Geof Carter	DOC VK5KG	34mins	Colour	1984	Geof is a Dept of Comms. Field Officer
-	Doppler Direction Finding for Foxhunters		VK2BYY WIA NSW	43mins	Colour	1985	Raw Unedited; from 75 aniv. VK2 Seminar
w	Fitting BNC Connectors		OTC	7mins	Colour	1985	Correct Assembly of Crimp type BNC plugsx
w	Handling Static Sensitive P.C.Bs.	Paul Tardent	OTC	6mins	Colour	1986	Improving reliability of Printed Ccts.
-	Extra License Grades		VK2ZTB WIA NSW	70mins	Colour	1986	Raw Unedited; from 1986 VK2 Seminar
-	Thick Film Modules		VK5DI VK5KG	45mins	Colour	1988	Descr. of modules available from VK5 WIA
NEW	Quartz Crystals	Clem Tilbrook	VK5GL VK5GL	106min	Colour	1988	"Nuts & Bolts" expert technical lecture

NOTE: c = Copyright; no copy service..
w = available ONLY to Radio Clubs Affiliated with the WIA as per agreement with OTC.
* = Optically Converted to PAL from NTSC by WB2LLB; noticable flicker.
o = program now out of date

Standard Formats: "Beta"; "Video-8" St & L Play; "VHS" St & L Play, "Dolby" and "Hi-Fi" sound - please specify when ordering.

WIA VIDEOTAPE NEW PROGRAM TITLE LISTING as of 1/1/90

See Note	TITLE (in chronological order within each subject grouping)	Lecturer	Prod.		Approx Dur.	Col/ B&W	Year Prod	Description and/or Other Information
MICROWAVE TECHNIQUES								
n	Introducing Microwaves	Des Clift	VK5ZO	PJ Vid	74mins	Colour	1988	"Nuts & Bolts" expert technical lecture
AMATEUR TELEVISION: GENERAL INTEREST								
n	The Development of the TV Test Card	George Hersee	G8PTH		43mins	Colour	1988	Made for BATC by the BBC Training Dept
MISCELLANEOUS								
n	Quartz Crystals	Clem Tilbrook	VK5GL	VK5GL	106min	Colour	1988	"Nuts & Bolts" expert technical lecture

n = New Addition Standard Formats: Beta; Video 8 St & L Play; VHS St & L Play, "Dolby" and "Hi-Fi" sound - please specify when ordering.

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
9 WEST TERRACE MININGIE 5264

All times are Universal Time Co-ordinated and indicated UTC

Amateur Bands Beacons

In accordance with current practice only changes to the beacon list appear this month. New listings are:

50.062	KH6HME	Hawaii
50.066	AL7C	Alaska
50.074	KH6HI	Hawaii

Return To The Fold

After a stay in hospital of almost eighteen weeks I was fortunate to be allowed home on the Saturday before Christmas and what a welcome sight it was after such a long absence. For all who have enquired and those who are interested, I am pleased to report that the third operation on my back appears to have been a success. With continuing exercises and physiotherapy a reasonable degree of walking should be possible although it may take twelve months to achieve. However, I have always been known as a fighter so while there is life there is hope! Many thanks for your cards and phone messages.

For several months these notes have been prepared under extremely difficult circumstances culminating in no notes for January due to an operation being scheduled at the time. I thank readers and the Editor of AR for understanding the position.

The Higginbotham Award

My stay in hospital was considerably brightened one day when I received notification that the 1989 Higginbotham Award was to be mine.

I am indebted to the Selection Committee for the bestowal upon me of this award. It is the second time I have received it, the first being in 1976.

While I have always believed in the worth of amateur radio and the VHF and UHF bands in particular, I have never aimed for such recognition; I have always believed there was a task to be fulfilled and tried to do that to the best of my ability. That my efforts have been recognised is an unexpected bonus — thank you.

Six Metres

During December six metres has been much as expected. There have been some very good Es openings around the country but they have not been sustained as one expects during periods other than the peak of the sunspot cycle. That this situation exists now is amply demonstrated by the very sporadic nature (no pun intended) of band openings between Christmas and New Year.

Nevertheless, there have been some good contacts to YJ8, FK,3D2 and ZL via Es and some of these have extended as far as VK5. ZLs and VK7s were noted around 0200 on 28/12, later at 0813 Garry VK5ZK worked YJ8GP; then many hours of VK4 to VK5 and other States on 29/12; on 30/12 it was the turn of VK6AOM from Esperance and others from Perth, to VK1, 2, 4, 5 and 8. During the morning of 31/12 VK2AAC was observed working VK9NS whose signal extended into VK5. Many other VK2s were noted, also VK1RK.

However, we cannot match the Northern Hemisphere where it has been noted the JAs have been working to KL7, W and VE7.

According to Bill Tynan's "The World Above 50 MHz" in January 1990 QST, September 1989 brought scattered openings, but between 13 and 16 October there were notable openings, producing long path contacts to Japan and covering an area from Virginia to Oklahoma. Stations further south and to the east made many JA contacts. VP5D running 10 watts worked more than 100 JAs! The long path propagation for the first time extended to Hawaii and six metre operators there obtained their first European contacts. KH6HI reported that beginning at 0800 on 14/10 he worked 5B4AZ, ZC4MK, SV1DH, SV1AB, SV1OE and eight 9H1 stations. Bert said the 5B4CY beacon was still in when he closed at 1100. Several other KH6s were included, which resulted in WAC for some. No KH6 had previously been able to qualify for this award.

On 23/10 South Africa became available to several areas of the US.WA6BYA worked Z23JO in Zimbabwe; later he and N6AMG and K6QXY worked ZS3AT and ZS3E. These were eventually worked by stations in Ohio and Texas. On 7/11 an excellent opening allowed K71CW to hear Z23JO on his IC-502 and whip antenna!

Between 25/10 and 31/10, W6JKV and K6MYC visited the island of Ponape in the Republic of Micronesia, taking a two metre EME set-up plus six metres, on which band they had QSOs with four KL7s, six KH6s, six 9H1s, one ZL, five VS6s, 14 VKs, the western portions of the US and Canada, KG6DX and some 300 JAs. The calls used were V63JT and V63AU.

Letters

Several letters arrived while I was in hospital, and must now be mentioned.

Don, VK6HK, has written to include an update of his Six Metres Listing and added that his recent most memorable day was on 31/10/89 when the band opened to Europe around 0830. He had 50 QSO's (which included some phone and CW duplicates) in G, GJ, GW, PA and SM. One beacon, GB3NHQ, was copied at 559. Signals ranged from threshold to S9 until about 1045. Plotting the Maidenhead Locator Squares for all these contacts showed the target area was confined to an arc of shallow width from Wales, Southern England, Holland and Sweden.

Graham, VK6RO, has lifted his score to 17 countries when he worked PA0HIP at 1052 and PA3ANU at 1114 on CW on 27/10; on 28/10 he worked VS6XVD and VS6XCL around 1150.

Steve, VK4KHQ, writes from Mount Isa to say that six metres had been relatively quiet since 7/1/89 despite hearing beacons in VK2, 4, 5 and 8. When the band is open to JA Steve usually tries RTTY and has had a number of successful contacts using this mode. On 6/10/89 he worked JH1WHS for the eighteenth time, including six RTTY contacts.

Bruce, VK4KIT, also of Mount Isa, worked KG6DX on 19/8 and VS6XWU on 28/10 at 1313 UTC. A comment from Bruce was that 49 MHz video signals have been audible from the north to NNW on most days of the year between 0400 and 0800 and again from 0900 to 1300.

Neville, VK2QF, in a letter dated 5/11/89

said to that date 50 MHz had been rather unproductive. Only two new countries had been worked — HH7PV at 2138 on 19/9 and V63JT at 0502 on 28/10, giving him 51 countries confirmed and a final total of 54 countries when the above two and XF4L reply. I attempted a follow up to determine the present position but four telephone calls could not catch up with the elusive Neville!

Nev commented that to 5/11 nothing had been heard from Europe despite many hours of monitoring and calling. Moscow and Scandinavian TV were prominent. On 29/10 with 48.250 and 49.750 videos at S9, he found another video on 53.7396 at 0850. This was subsequently identified as an Italian inverted channel (video at the high end and audio on 48.2396), however no contacts were made.

Commenting on the 50 MHz beacon situation, Neville believes there is little value in beacons as most amateur stations have a greater ERP and contacts are usually established without reference to the beacons. Also, the Wagga Channel 0 TV 100 kw of video on 46.24 and 10 kw of sound on 51.74 are becoming well known overseas; these frequencies, together with those of other TV stations and two-way radio traffic and paging signals between 40 and 50 MHz all provide useful warnings of possible contacts on 50 MHz.

Brunei

Andrew, V85DA, at Brunei said in a November letter that apart from almost daily openings to JA there has been little six metre activity from his area. On 6/11 he could hear the JAs working to the west coast of USA, V63 etc. but nothing at Brunei. However, at 0200 he worked HL9TG with 559 fluttery signals.

He comments that it appears the F2 layer works well away from the equator, but the E layer is so excited in equatorial regions that no signals can get down to the ground. So F layer supports DX and E layer traps the signals between E and F until it gets out to a low E-ionisation area. That's the way he sees it!

Looking at Andrew's list of contacts for September/October/November there are a couple of hundred JAs, almost daily contacts to Darwin through September; 25/9 at 1444 to VS6XVD and VS6XCL and on 11/10 VS6WV. On 25/10 at 1320 he worked VK8AH who reported he had worked 9H, SV and had heard European beacons. 1/11; 9V1RH reported PA to VKQSOs had occurred on 30 and 31/10.

Regarding the value of 52 MHz, Andrew says it is educational to hear what signals are on that part of the band when the band is open to JA. At times he can hear FM conversations on every 10 KHz from 52 to 54 MHz. On 52.525 there seems to be a packet BBS station which makes it rather pointless calling CQ DX on that frequency. Another interesting signal sounded like a repeater, with squelch tails, mobile flutter, traffic noises etc., but then, officially, there are no repeaters in Japan!

During a September spell in Darwin, Andrew was given royal treatment by the local amateurs. Rex VK8RH has a six metre amplifier running 200 watts from 12 volts. While in Darwin, the locals were continuing to work JA on two metres SSB, with VK8RH having worked over 150 JA stations. Rex also monitors 52.525 FM and this later resulted in Andrew V85DA working him on returning to Brunei.

At the end of October Andrew attended a SEANET Convention in Singapore where the attendance was about 150 amateurs plus families. He met a number of JAs he had worked, plus many of the 9V1s, 9M2s and 4S7PB.

While in Singapore he operated on 50 MHz as 9V1ES and during the week of operation worked about 700 contacts, all JAs except four to VK8. The station was sponsored by JA1UT.

Finally, Andrew asks the question — what propagation path is being used for the VK to Europe contacts ie direct, short or long path, or backscatter? As far as I can determine, the signals have been mostly direct and on the short path but occasionally a few weird paths have been involved, such as 45 to 90 degrees from an apparent direct path.

Melbourne News

John, VK3ZJC, says he has spent a few hours sorting out the beacon and repeater listings in the new WIA Call Book and has so far found 32 mistakes! He also reports that increasing packet activity on 144.800, the Adelaide VK5VF beacon frequency, virtually precludes any reception of the beacon in Melbourne. That being so, it seems inevitable a frequency change will be necessary.

On 20/10 there was an auroral openingto VK7 on six and two metres. On 22/10 it was reported that VK5NC in Mount Gambier had worked VK1BG, VK2ZRE and VK3XRS all with their beams pointing south.

John reported that activity on 1296 was low during the winter months. He maintains regular propagation checks with Roger VK3XRS in Bairnsdale. Signals are subject to some slow QSB and vary from 6 to 10dB above the noise. When Roger leaves his Keyer on for extended periods, John has noted peaks around 0100 and 0700, very poor from 0730 to 1000. In the evening there is a further peak around 1030 followed by a steady decline extending at times to a further peak around 1500.

A letter to John from Ross VK2ZRU indicates there are about five SSB stations on 1296 MHz in Sydney and none in country areas. They are also starting to have problems with FM-only stations on 1296.100. Ross runs a water cooled 2C39 linear on 1296 with 250 watts input, with four 28 element loop yagis and a GaAsFET preamp.

In Melbourne recently, a group of FM-only and multimode stations discussed the problem of FM on 1296.100 and came to an agreement to keep that frequency clear and use 1298.100 MHz for FM. The reason for this choice is that most of the SSB stations also use FM for ragchewing and crossbanding, some have transverters from two metres which can cover only 1296 to 1300, so 1298.100 has become an unofficial net. When the new band plan is finally promulgated, the FM-only stations will be able to use any frequency within their range but using 1298.100 for an unofficial natter and liaison frequency and leaving 1296.100 for narrow band modes.

In VK3 there appear to be about 34 stations with 1296 MHz capability, 16 are using SSB and horizontal beams and 6 are located outside of Melbourne.

The World Above 50 MHz

Congratulations to QST magazine which in December 1989 celebrated 50 years of presenting the segment "The World Above 50 MHz." At present the columns are prepared by Bill Tynan W3XO, with whom I exchange monthly information. In December 1939 Ed Tilton, W1HDQ, presented the three pages with the title "On the Ultra Highs." The band was then called five metres and consisted of 56 to 60 MHz with the record trop distance being 450 miles. W9ZJB of Kansas City, Missouri, was the first amateur to work all nine call areas of the US. His equipment consisted of a pair of T-20s running 120 watts and the receiver used was a Hallicrafters S-10.

The columns also included information on the use of 112-116 MHz where W1KH used a Western Electric 316A "door-knob" tube capable of 8 watts. He also used a pair of RK-32s running 300 watts! In the Boston area distances of 25 miles were being covered regularly. Reports were also included for the 224-230 MHz band.

Ed Tilton now lives in Florida and has the call W1HDQ/4.

Closure

As I am slowly getting back into harness I will close the column at this point, allowing room for the Six Metres Standings information.

Two thoughts for the month: "One man cannot hold another man down in the ditch without remaining down in the ditch with him" and "If you look like your passport photo, in all probability you need the journey."

73. The Voice by the Lake

50 — 54 MHz DX Standings

DXCC Countries based on information received up to 15 Dec 1989. Cross-band totals are those not duplicated by six metre two-way contacts. Credit has not been given in columns 1 and 2 for contacts made with stations when 50 MHz was not authorised.

Column 1:	50/52 MHz two-way confirmed
Column 2:	50/52 MHz two-way worked
Column 3:	Cross-band (52 to 28 MHz) confirmed
Column 4:	Cross-band (52 to 28 MHz) worked
Column 5:	Countries heard on 50 MHz

Column 6: Countries heard on 52 MHz
Column 7: 50 MHz two-way worked (1963-30/6/1989 — temporary listing)

Call Sign	1	2	3	4	5	6	7
VK8GB	42	42			13		
VK4ZJB	32	32				4	
VK2BA	31	32					18
VK2VC	27	27					
VK2QF	27	29					25
VK2DDG	25	26		2	12	3	
VK3OT	25	26			10		
VK3XQ	24	26			1	1	
VK3AWY	22	22					
VK2KAY	21	23					
VK5LP	21	22			6	3	8
VK2BNN	20	21					
VK4ALM	20	20					
VK4TL	19	19					
VK7JG	18	20				2	
VK4ZAL	18	18					
VK3AMK	17	17					
VK9XT	17	21					
VK3AUI	17	21					
VK3NM	16	17					
VK6RO	16	18	3	3	7	3	
VK4ZSH	15	16					
VK2ZRU	15	16			1	3	
VK3ZZX	12	13					
VK9YT	12	14					
VK6HK	12	18	1		1	1	9
VK4KHZ	10	10					12
VK6OX	10	10	1	1			
VK8ZLX	10	13					32
VK4BJE	7	7					3
Overseas							
JA2TTO	48	48				6	

Column 7 lists those 50 MHz contacts between 1963 and 30/6/89 which have been supplied to me and NO DISTINCTION IS PRESENTLY BEING MADE no matter from which State they have been received, or any relevant QSL information. The present separation between 50 and 52 MHz will assist me to make a decision as to credibility at the appropriate time. All Standings information (from day one) is now stored in the computer so that any adjustments should be relatively straightforward.

A minimum of five countries confirmed (including VK) is required for an operator to be listed.

The list position is determined by the number of confirmed contacts. Where two or more operators claim the same total, those first date listed with that total can only be displaced by another having a greater number of confirmed contacts.

The next list will appear in August 1990 and entries will need to be on my desk no later than 20 June 1990. Claimants are reminded that full details of all contacts are required; viz: date of contact, time in UTC, call sign of station worked, country, mode, report sent and received, QSL sent and whether received, split frequency contacts should be indicated. Please add your own call sign, signature and date.

i reserve the right to request and examine any QSL cards which may be needed to support an application for listing. To assist your claim a useful idea is to include photocopies of the front and back of QSL cards.

PLEASE NOTE: Those operators who have already claimed 50 MHz contacts after 1963 and prior to 1 July 1989 are asked to submit a new list of countries worked between 1/7/1989 and 15/6/1990 as many possibilities exist for countries already nominated to be reworked during the coming autumn period of peak F2 activity.

Eastern States operators who worked 50 Mhz stations last autumn and earlier should not need to be told that they should try and work all of them again this autumn, especially if contacts were made after 0000 UTC which will probably be used as a cut-off time for Six Metre Standings Listings for 50 MHz contacts made during the past few years. From an examination of photocopies of many QSLs forwarded to me by claimants it is becoming quite clear that many Eastern States 50 MHz contacts were made prior to 0000.**ar**

HOW'S DX

Stephen Pall VK2PS
PO Box 93 DURAL 2158

Bouvet Island 3Y5X — 3Y0B

By the time you read this, the Club Bouvet DXpedition has successfully completed its task. The ship "Aurora" left Norway early in December for South America. In mid December at Montevideo, Uruguay, the amateur operating team joined the Norwegian scientific and helicopter crew on board the ship and headed to Bouvetya, as the island is called in Norwegian. The expected time of arrival at the island was Christmas day. Whilst on the high seas they used the callsign LA5X/mm to relay information about the progress of the voyage. The ship arrived at its destination on the 26th of December. No landing was possible on that day due to fog, blizzards and 24 feet high mountainous seas. Finally, they managed the lift-off by helicopters from the ship on the 27th of December 1989, and started operating on 14145 kHz transmit frequency and receive from 14200 to 14220 kHz on multihop frequency basis. This operating procedure caused some confusion, and suddenly quite a number of "weirdo" operators (among them some suspected pirates) appeared on the well publicised and pre-announced frequencies.

Australasia is one of the most difficult places on Earth from which to contact Bouvet. The Americans and the Europeans heard them with signal strength 8-9, but the Sydney-Auckland-Norfolk Island area heard them only with a signal strength of S3 or less. The path to Bouvet is almost due South (SP) or due North (LP). The duration of the group's stay on Bouvet was 23 days. The expedition had five complete Icom stations. Up to the 3rd of December, the expedition had received 85.9% of donations towards its $100,000 target. Operation was SSB,CW, from 160 to 6 metres, RTTY on 20, 15 and 10 metres. The best chance to contact them from VK was on 20 metres. We hope that many of you made the contact with this very rare DX country.

If you missed the 3Y5X activity, then be prepared for the Legion of Indiannapolis DXers with the callsign 3YØB which should operate from Bouvet early or mid February. Besides Bouvet, this group hopes to go to South Sandwich Islands and activate that group under presumable VP8 callsign.

Laos XW8 And Vietnam 3WØ

January issue of "AR" gave detailed news of the re-activation of this much sought after country. Inh, the operator of XW8KPL is still active on a variety of frequencies. The station was established with the assistance of six Japanese amateurs under the leadership of Yoshi JA1UT. The station is in Vientiane at the National News Agency of the Peoples Democratic Republic of Lao, Khaosane Pathet Lao (KPL). The operating times are around 0400 to 0700 UTC and after 0900 UTC. They were heard on 14165, 21295, and on 28 MHz. QSL only by direct mail to the address given in January 90 issue of "Amateur Radio". Please do not send "green" stamps for return postage (US dollars) — only 3 IRCs (International Reply Coupons) and self-addressed reply envelope.

The Hungarian DX group, HA5PP — Zoli and HA5WA — George, arrived in Laos in the last days of November. They had considerable difficulties getting on air. Why? Details are sketchy. At one stage we heard that they have been denied the operating licence, later we were told that they have now the licence, but the owner of the hotel where they were staying did not permit them to put up their antennas. When they became active on the 8th of December 1989 with the callsign XW8DX and XW8CW many who worked them in the beginning doubted that they were genuine. They operated on 21035 — 21235 — 28025 — 28495 and 14195 kHz. When I spoke to them for the last time on the 20th December, they had over 18000 QSOs under their belt. They participated in the ARRL 10 metres contest with more than 2000 QSOs and about 80000 points. They planned to go back to Hungary on the 27th of December. The Spratly operation of this group did not eventuate. Unconfirmed reports said that "they missed the boat". QSL to: F6HIZ.

If you missed the Hungarians, maybe you have worked the Japanese in Laos. XW8KPV was on the air on the usual DX frequencies from the 22nd of December until the end of December. QSL to: JH1AJT.

To make the DX activity on the bands more exciting, XV2A from Vietnam has appeared on 21274 kHz at 0600 on the 22nd of December, operated by a Japanese group. QSL to: JA3UB. And another group was scheduled to operate from the 31st of December to the 5th of January under the callsign: 3WØJA. QSL to: JA7JPZ, to the Callbook address direct.

Macquarie Island - VK0

John, VK0JR arrived at Macquarie Island at the very end of November and appeared on the band on the 6th of December, "Saint Nicholas" day. John originally comes from Canada, married an Australian and settled in Perth 10 years ago. QSL to: VK9NS.

Western Samoa - 5W1

Had a long QSO with Pete 5W1KT. He is on a two year contract with the Western Samoan Government, and will be in 5W1 until the middle of 1991. Pete set up his station not so long ago, and is now in the serious DX-ing stage. There is no QSL Bureau on the Island and the local Amateur Club is practically defunct. Pete came to VK6 some time ago from South Africa, and was always interested in Amateur Radio since he was a boy. He started as a novice in VK6 and now he has his home call as: VK6KT. Pete has a vertical antenna for 20-17-15 and 10 metres, but hopes to have a beam soon. Pete will do his own QSLing and his logs are computerized. QSL cards have been ordered and QSLs should be sent to: PO Box 1672 APIA, Western Samoa, South Pacific.

Rotuma 3D2

Bing VK2BHC went back to Rotuma and started operating under the call: 3D2XV. Soon afterwards he fell ill and he had to leave the Island. At the end of December he was improving but still sick. In the name of our readers we wish him a speedy and full recovery.

Rotuma, however, continued to be active. Mats, SM7PKK arrived in Rotuma mid-December using the callsign: 3D2XR . He intended to stay on the island until the third week in January. QSL to: SM7PKK.

Anguilla - VP2

Every keen VKDX-er would at some time have worked Paul VP2EXX (Ex V47NXX). He is a first class operator in every sense and is often in demand for DXpeditions and multi-operator Contests. Earlier in the year he was on Desecheo KP5 with KP2A and more recently he was on St Lucia for the CQWW CW contest as N9AG/J6L and J6DX (QSL to: N9AG). A long term plan for Paul is to visit his friend UA9MA in Omsk in August 1990. Paul speaks good Russian, so he is very popular with the UA operators. If he does make the trip, he will be acting from several Oblasts. At the age of sixteen Paul has earnt his Big Gun status. QSL for VP2EXX and V47NXX to KC8JH.

Banaba Island And Conway Reef

It is now official. The ARRL Awards Committee has accepted the 16 member DX Advisory Committees recommendation to accept the Island and the Reef as a new DXCC Country, but only contacts after the 1st of March 1990 will be valid. Previous contacts made from Ocean Island (Banabas former name) will count, provided that the operator and his station was physically on the island when the contact was made.

At the same time, applications for Frederick Reef, Merquesas Islands, Tatoosh Island and Guemes Islands were not recommended for DXCC Status.

The only application for a separate country status is now Walvis Bay; the South African enclave in Namibia according to several sources. Walvis Bay, known until now as ZS1, has changed prefix. Ian ZS1IS is now signing ZS9A. The Walvis Bay application will be considered by the DX Advisory Committee in mid-January 1990.

Interesting QSOs And QSL Information

WA3ZXX/KP4 — Jeff — 14226 kHz at 1150 UTC. QSL to: KP4GY.

KH0AC — Len — 14226 kHz at 1222 UTC — QSL direct to K7ZA.

ZS500A — Special event station — 14220 kHz — QSL to: W3HUP.

OD5KB — Sami — 14220 kHz at 0612 UTC. Sami is employed at Beirut Airport — QSL to callbook address.

V73AT — Ted — 14165 kHz at 1115 UTC. Ted's former callsign is KX6HE. QSL to: K2CL.

5W1HM — Kiyoko (yl) 21250 kHz 1045 UTC. QSL to: JH1IFF.

NH6RT/P/KH8 — Kiyoko's other callsign (details above).

VE3DJ/V2A — Jock — 21248 kHz at 0326 UTC. QSL to: homecall.

KG4DD — Doug — 14235 kHz — 0637 UTC. QSL to Box 692 FPO NY. Zip: 09593-0055 USA.

F6IGS/FO — Gerry — 14233 kHz at 0940 UTC. QSL to the French DX Foundation: PO Box 88, BRUZ, 35170, France.

TA1AL — Mustafa — 14222 kHz at 0600 UTC. QSL to 1990 Callbook Address.

HS0E This is a Thai Club callsign and it is used by different visiting amateurs. You should ask for the home call of the operator and the QSL route. Between the 7th and 12th of December, the operator was John, K9EL (QSL to home call). On the 20th of December the operator was Sombat: HS1BV.

9M8FH — Festus — 14226 kHz at 1214 UTC. QSL via the Bureau or Callbook.

VU2GI — Govinda — 14226 kHz at 1218 UTC. QSL to: N2HOS.

IK2GNW/V73 — Andriano — 14222 kHz at 0603 UTC and T29GM on 14195 kHz. The operator was Andriano again who is on a Pacific DX tour. According to unconfirmed reports he fell ill with high fever and left for Italy via Hawaii. QSL to home call.

F6ESG/OD5 — Patrice — 14 MHz — CW — at 0430 UTC. QSL to home call.

3A2LF — Claude — 14 MHz CW at 2050 UTC. QSL to: callbook address.

PJ2/OH6XY — Carl 14 MHz CW at 2100 UTC. QSL to: home call.

9H3GQ — Werner — 21 MHz CW at 0400 UTC. QSL to: DK4SW

HB9AHA/J6L — Rene — 21 MHz CW at 2100 UTC. QSL to: home call.

ZF1HJ — Jack — 21 MHz CW — at 2200 UTC. QSL to: PO Box 1215 George town Grand Cayman Island, Carribbean.

XX900 — Fred — 21 MHz CW at 0900 UTC. QSL to: F Fisher 259 W Cook Rd Mansfield — OH 44907 USA.

CN8MC 21 MHz CW — 1100 UTC. QSL to: Associacion de Radio Amateurs du Maroc Box 299 Rabat, Morocco, Africa.

VP2EM — Harold — 21 MHz — CW — 0100 UTC — QSL to: KV4AM

HC8/HC1LT — Luis — 21 MHz. CW 0430 UTC. QSL to: LD Troya, Box 289 QUITO ECUADOR South America.

P29VPY — Paul — 21 MHz CW at 0817 UTC. QSL to: K1XM

9K2KS QSL to: ON7LX — TZ6VV QSL to: N0BLD — TT8GA QSL to the French DX Foundation (see address above) — YI0BIF QSL to: KA1DE — V29OA QSL to: W7KNT — HP1XSO QSL to: Box 842 Clayton Rep of Panama. J88BS QSL to: WA4WID — IYØONU Special UNICEF station. QSL to: I5KKW — ZZ5UF QSL to: PP5AA — HS2ZW QSL to: IK8DOI — YJ1TRS QSL to: PO Box 217 Port Villa, Vanuatu. CO2OM QSL to: Box 4910 Havana 4, Cuba. 6W7OG QSL to: F2YT — P29CG QSL to: WB9SVK, call book address. HZ0AB QSL to: K8PYD — XX9KA QSL to: KC9V — ZF2HR, QSL to: SM5BUS KA5UWN/KH2, QSL to: WD5GIV — ZW0F QSL to: PY7ZZ.

From Here And There And Everywhere

Jean Pierre — 5T5SR (Mauritania)_ has been coming up on 10 metres around 28555 kHz at 2200 UTC. He has been also on 21280 kHz at 0930 UTC. QSL direct only to: PO Box 51, ATAR, Mauritania, Africa.

Jimmy, JH1MAO/JD1 (Minami Torishima) operated on 28477 kHz almost daily in November. QSL to his home call. JD1YAA, Aki, was heard also on 28581 kHz. QSL via JA1OGE or Bureau. Dimitri SV5ADM was calling CQ on 28522 kHz at 0655 UTC. The band was very quiet, and he was a good one for the log from the Dodecanese Islands. QSL to Callbook address. OD5KB says that Hany OD5KV, who was very active last year on the 212o5 and 14222 nets, has moved to London, and will try to obtain a G callsign. Jorge D2/LU6ELF, on short notice, appeared on the "222" net on the 14th Dec. A few VKs managed to contact this elusive station. QSL to: N4THW: Mr Carlos A Vega PO Box 22541 Ford Lauderdale Fla, Zip: 33335 USA. Brazilian stations using the additional suffix of /PR100 are celebrating the 100th Anniversary of the Republic of Brazil. According to unconfirmed reports, Piet, a Dutch missionary will shortly commence operations from the Central African Republic under the callsign TL8PN. The Knights of Malta station, 1A0KM intended to be active for 24 hours on Christmas Eve. However the operators decided to postpone the activation of the station to a date somewhere in 1990.

Reason: There is too much DX activity at the moment, and they do not want to compete with the others.

Xenon, LU1ZA was active for one year from South Orkney Islands situated in the Antarctic Atlantic Ocean. At the very end of his stay, with the assistance of Sergio LU1HM on the Argentinian end, and Jim VK9NS on the Australian end — under difficult propagation conditions — he came up on the "222" net. A few VKs and ZLs were successful in establishing contact. Xenon is an army officer and his tour of duty ended before Christmas. QSL to: LU2CN. Trevor, VK9TR is part of the meteorogical team on Willis Island. he will be on the island for 6 months. He is very busy professionally, which leaves little time for him to enjoy amateur radio. QSL to his home call: VK5FG which used to be his late father's callsign.

Oops...Or The Mistakes Department

It had to happen, sooner or later...In the December 89 Issue of "Amateur Radio", page 37, under the item dealing with the "222" net there is a mistake which was discovered by the writer of this column as soon as I saw the printed copy of the magazine, and by Jim VK9NS and Neil VK6NE, but nobody else, which surprised me. The Heard Island Expedition by Jim and Kirsti was conducted under the callsign of VK0JS and VK0NL. The call signs VK0HI and VK0CW were operated by Dave Shaw VK3DHF and Al Fischer K8CW from the 21st of January to the 21st of February 1983. This other DXpedition was organised by the VK6 DX Chasers Club and was connected with the mountaineering group of William Blunt. The mountaineers were the second group which climbed Big Ben at the top of Mawson's Peak. The whole group travelled in the maxi-yacht Anaconda II.

Jim's expedition, VK0JS, was sponsored by the Heard Island DX Association (HIDXA) and used the British built 156 feet ex-whaler, Cheynes II which underwent a massive re-fit prior to departure to the island. The HIDXA Expedition had 18 members including several scientists, and researchers. The amateur group consisted of Jim VK9NS, his wife Kirsti VK9NL, Sjoerd (Sojo) VK0SJ, Bob WA8MOA, Walt W7SE and Werner OE1LO. The expedition made approximately 14000 plus contacts with 138 countries. The voyage to Heard Island and back to the mainland is a story for itself. Blizzards with winds gusting to 60 knots, seas with 20 to 30 foot waves, shortage of water (Cheynes II was a steamship) and shortage of fuel on the way back. This necessitated to use makeshift sails made of old lorry tarpaulins. The ship actually "sailed" 855 nautical miles in 368 hours at an average speed of 2.34 knots. The armchair DXpeditioner sitting in the shack making the short contact which gives a new, "DX country", never realises the difficulties endured by the dedicated to put a new "DX country on the air.

The Big Question

Have you given further thoughts to the series of questions posed by me in the January 1990 issue of "AR", in the "How's DX" column? Did you voice your opinion by dropping me a line to PO Box 93 Dural 2158? If the answer is: yes, I thank you for your cooperation. If the answer is: no, then please read the end of the January 1990 DX column again. I would like to publish the results as soon as possible, but I need your comments first.

Finally many thanks, for the assistance received from Pat VK2RZ, Les VK4DA, Neil VK6NE, Jim VK9NS, Yoshi JA1UT and the DX bulletin "QRZ DX".

73 and good DX to all of you. **ar**

EMC REPORT

HANS RUCKERT VK2AOU EMC-REPORTER
15 BERRILLE RD BEVERLY HILLS 2209

Several EMC Short Stories

1) Canadian Success Story:

(from Radio Communication 6/89 and CQ/DL 11/89).

Readers will remember the reported very sad story of the VE3SR — Jack Ravenscroft court decision (AR 11/1988). Raymond Perrin, the Director of the CRRL in Ontario, VE3FN, reports that a neighbour of a radio amateur had claimed that several of her technical appliances were affected by the transmission of the next-door radio amateur. At first, the court decided that the radio amateur had to stop operation. She had refused any attempts to have the susceptibility of the equipment overcome. Mr Perrin was acting as defence expert, and he was supported by all other experts including the observer of the Department for Communication. The judgement has now been reversed, so that the owner of the appliances has to have her apparatus modified. Mr Perrin stated that:

a) A transmitter can then only cause interference if the transmitter does not meet the legal technical standards.

b) A transmitter can never cause an equipment malfunction, if the equipment is not designed to be a radio receiver.

c) If this kind of equipment is affected, then it is only caused by design faults of this equipment.

d) The claim, that the unwanted effect does disappear, when the transmitter is switched off, is technically wrong.

Mr Perrin made the following statement:

"If rain gets through a roof, it does not mean that we have to stop the rain. We have to fix up the leaking roof, because the problem is caused by the leaking roof."

It is hoped, that this will be considered a worldwide test case; that the law-makers will place the blame where it belongs, and that the public will be educated accordingly.

2) Audio and VIDEO Plug Connections: (By DG40AA) CQ/DL 11/89). A number of widely used plugs are shown, which rarely provide shielding. Many examples had an interruption of the earth to equipment contact, or no reliable earth contacts. Pressure contacts instead of soldered contacts are often unreliable. Metal particles containing paints are often not conductive at all. Only all metal plugs and connectors and jacks should be used to avoid EMC problems even with correctly designed appliances.

3) Cable-TV and Satellite-Operation: (By DC8TS, AMSAT-DL 2/89). I experienced

during the last months interference to my 2m satellite reception, because the special channel-6 was used by the Cable-TV operation. 145.739 and 145.981 were particularly affected. There was splatter between 145.94 and 146.00 MHz, the degree of which depended on the modulation of the TV signal. The test tone was still audible after closure of the transmission. The other frequency affected especially the reception of the R-6 relay channel. This interference is totally unacceptable being caused to an amateur radio exclusive band. It is at best wishful thinking by the cable-TV firms, that their system is RF tight. The Americans found out already many years ago — and that is still so — that cable-TV transmission is not as RF tight as claimed. This system caused interference to amateur radio reception and it picked up legal transmission as well. VK3QQ reported these problems years ago. After collecting the necessary details, I wrote to the cable-TV firm, who claimed that they cannot find anything wrong with their set-up, and they know nothing about an exclusive amateur radio frequency band. They stated that they were willing to ask the Post-Office about this last point. It was between Xmas and New Year, when a PMG testing vehicle stopped suddenly at my house. They confirmed the interference observations. With a 20 dB preamplifier working at 145.981 MHz the S-meter of my receiver deflected 60% of full scale over an azimuth range of at least 90. The officers found that an inadequately shielded cable going to the TV-set caused the leakage (this is usually the case). When the correct cable and the PMG-TV set was used, no trace of interference was observed, but who has a TV-set in a shielded metal case!? The behaviour with my low noise preamplifier is now as it was earlier without the preamplifier. It is clear, that Cable-TV is quite unable to be sufficiently RF tight not to interfere with preamplifier receivers using the amateur radio frequency band. Cable-TV must never use amateur band frequencies, and they know that this will cause RFI. The firms who plan now to introduce Cable-TV should be told now that Amateur Band Frequencies must never be used for their service.

4) Channel S-6 in Sweden: (CQ/DL 12/89)

The Standards Commission (SIS) of Sweden laid down Standards for the Cable-TV service as reported in "QTC" 7/89. The new standard was established by the Svensks Elektriska Commission (SEK), committee TK12X included representatives of the Swedish Amateur Radio Organization SSA. The following channels must not be used for Cable-TV to avoid possible interference to aircraft communication: S-1 to S-5 (108-139 MHz). S-12 (242-244 MHz). S-24 — S-25 (328 — 335.4 MHz). To protect emergency traffic S-33 to S34 (405 — 407 MHz). Also the following channels should be avoided to avoid interference to the Amateur Radio Service: S-6 (144-146 MHz) and S-37 (432-438 MHz). It is hoped that other countries and their Cable-TV companies learn from this Swedish understanding of the problem before they start to use certain channels.

5) Signal splitters and combiners - a risk of EMC problems: (DL7AOH CQ/DL 9/89).

This publication shows x-ray photographs of a number of signal splitters and combiners. The lack of shielding and reliable connection for the earthed wires was found to be the main fault. The technical data supplied were in some cases misleading. Only totally shielded units can be recommended. Unreliable contacts were also found in one case. Completely shielded units with soldered connections inside were found to be OK. **ar**

CONTESTS

FRANK BEECH VK7BC FEDERAL CONTESTS MANAGER
37 NOBELIUS DRIVE LEGANA 7277

February;
24 — 25th REF French contest, Phone section. (Rules December "AR".)
24 — 25th UBA Belgian contest, Phone section. (Rules January "AR".)

March;
10 — 11th RSGB Commonwealth contest. (Rules January "AR".)
17 — 18th NZART National field day contest
17 — 18th WIA John Moyle Memorial Contest. (Rules this issue.)

The three main contests that attract VK/ZL stations next month are listed in the above calendar. Since the publication of the rules of the RSGB Commonwealth contest in January's "AR", I have been advised that a group of amateurs in Victoria have obtained permission to run a "HQ" station in this year's event, and will compete using the callsign VK3WIA. This station, like the "HQ" stations in other Commonwealth countries will attract bonus points, so are well worth the effort of contacting.

In the John Moyle contest, which coincides with the ZL field day contest, VK amateurs are encouraged to work the ZL stations, but please note, the repeat contact rule: for all overseas contacts, ie, ZL, W, DL, etc, no repeats are allowed — just the normal one contact per mode per band, as in almost all international HF contests.

Due to the amount of time that I have spent during the Christmas, New Year period looking out for the Bouvet DXpedition, and putting the finishing touches to the 1989 RD logs, these notes will be shorter than usual. I hope you all send in logs for the Ross Hull contest and the second trial VHF/UHF field day contest. Please do not forget.

John Moyle

Contest Period

From 0100 UTC March 17th 1990, until 0800 UTC March 18th 1990.

Objects

To encourage portable operation on the amateur bands by Australian amateurs, and is intended to help amateurs become familiar with portable operations, and thus assist in training them for emergency situations. Emphasis is placed on working between portable stations.

Divisions

There will be two divisions;
Division "A" 24 hours.
Division "B" 6 hours.
In each division, the operating period must be continuous within the time period allocated for the contest.

Sections

In each division there will be separate sections as follows;
"A" Portable field station, TX phone single operator.
"B" Portable field station, TX CW, single operator.
"C" Portable field station, TX Open, single operator.
"D" Portable field station, TX Phone, multi-operator.
"E" Portable field station, TX Open, multi-operator.
"G" Portable field station, TX VHF, multi-operator.
"H" Home station TX, emergency powered.
"I" Home station TX, mains powered.
"J" Receiving stations.

Station Definition

A portable station is one which operates from a power supply which is independent of any permanent installation, ie batteries, solar, wind, portable motor generators.

A SINGLE OPERATOR station is one where the work involved in setting up the station is carried out by the person who operates the station. No assistance can be received apart from the provision of food and security etc.

A multi-operator station is self explanatory.

No radio apparatus may be erected on the site earlier than 24 hours before the contest period commences.

Bands

All amateur bands may be used with the exception of the 10, 18, and 24 MHz bands.

Multi-Operator Stations

Such stations shall provide a separate log for each band used.

Only ONE transmitter may be used on a given band at any one time, whether operating in phone or CW mode.

ONLY ONE CALLSIGN may be used from a multi-operator station.

Contacts

Cross-band contacts are not permitted.

Cross-mode contacts are permitted. However they will count only as phone contacts for scoring purposes.

Contest Exchange

The exchange between stations will consist of a cypher comprising the RST report as applicable, followed by a serial number commencing with 001 and increasing by one for every contact. Following the serial number, a letter must be added indicating the section "A" to "J" in which the station is competing. Both cyphers sent and received must be entered into the log.

Repeaters

Operation through any terrestrial repeater is not allowed for scoring purposes. However, the use of such is allowed for the purpose of arranging contacts. Contacts made by using orbiting satellites or EME as a medium are allowed.

Modes

AM, FM, SSB, all count as phone.

RTTY and CW are both regarded as CW.

It would not be expected that the more exotic modes would be used in this contest.

Scoring

Scoring for portable field stations.

Portable/mobiles outside ones own call area ..... 20 points

Portable/mobiles within ones own call area ..... 15 points

Home stations in section "H" outside ones own call area ..... 10 points

Home stations in section "H" within ones own call area ..... 5 points

Station "1" irrespective of call area. . . 2 points

ZL stations who are in the NZART field day contest and are portable ..... 20 points

Other stations who are in the NZART field day contest ..... 10 points

Scoring for Home stations, emergency powered.

Portable/mobile stations outside ones own call area ..... 15 points

Portable/mobile stations within ones own call area ..... 10 points

Home stations section "H" irrespective of call area ..... 2 points

Home stations in section "I" irrespective of call area .....2 points

Scoring for home stations mains powered.

Portable/mobile stations outside ones own call area ..... 10 points

Portable/mobile stations within entrants own call area 5 points

Home stations in section "H" irrespective of call area 2 points

IN ALL SECTIONS A STATION MAY BE WORKED ONCE ONLY PER BAND, PER MODE.

CW contacts. In all categories CW to CW contacts will earn double points.

Bonus Points

For any contact made by using a natural power source, a bonus of 10 points may be added. A natural power source is regarded as one the power for which is derived from solar cells, wind, methane gas etc, as well as from batteries which are completely charged by natural means. All power produced in this category must have been derived independently of commercial mains or the use of petroleum derivatives.

Receiving Stations

Stations in this section must record the cyphers being sent by the stations operating in the contest within sections "A to G" inclusive. QSO points will be on the same basis as for Home stations section "I".

Log Format

All logs shall be set out under the following headings;

Date, Time (UTC), Callsign of station worked. Band. Mode. RS/RST and serial number sent. RS/RST and serial number received. QSO points. Multiplier. Bonus. Total claimed.

Each log page must carry a progressive

IAN J TRUSCOTTS

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total points score claimed at the bottom of each sheet.

Summary Sheet

For bonus points to be claimed, suitable evidence must be provided as to the method of natural power generation employed. Such evidence should take the form of a photograph of the generating equipment used, or a signed statement by another amateur, showing his callsign, declaring that he has inspected the generating equipment referred to.

Front Sheet

Each log must be accompanied by a front sheet that provided the following information Name. Address. Callsign. Division (6 or 24 hours). Section (A to J). Station location. Number of contacts. Claimed score.

The front sheet must also indicate:

Equipment used. Power supply used, and in the case of multi-operator stations: a list of all the operators names and callsigns, together with their signatures. The front sheet must also carry a declaration signed by a licenced amateur as follows; "I hereby certify that this station was operated in accordance with the rules and spirit of this contest" .

Certificate And Trophy

Certificates will be awarded to the winner in each section of each division. The 6 hour certificates cannot be won by the 24 hour entrants. The Contest Manager also reserves the right to award other certificates where the effort made by a specific station is of special worthiness. The highest CW scorer outright in the contest, irrespective of the section of the contest entered, will receive a trophy in the form of the Presidents Cup to hold for a period of twelve months. This award is to encourage operators to utilise the CW mode whenever possible.

Disqualification

The general WIA contest disqualification criteria as published will apply to this contest.

Log Submission

Logs should be forwarded to the Federal Contests Manager.

Frank Beech VK7BC, 37 Nobelius Drive, Legana, Tasmania 7277.

The front of the envelope should be endorsed "John Moyle contest".

Closing date for entries is April 27th 1990. **ar**

AWARDS

KEN GOTT VK3AJU FEDERAL AWARDS MANAGER
38A LANSDOWNE RD ST KILDA 3183

WIA Awards Programme

Applications and enquiries about federal WIA awards should be addressed to Ken Gott VK3AJU, 38A Lansdowne Rd, St Kilda, Vic 3183. A SASE for reply is always appreciated when making an enquiry.

General Rules For WIA Awards

Cost: Free to WIA members. VK non-members pay $A5 and others $US5 or 8 IRCs. However, $5 is payable by members for special event awards such as WIA 80 (see below).

Verifications: Applications must hold unaltered QSL cards for all QSOs claimed and these must show clearly the time, date, mode, frequency and signal report sent by the station concerned, and its location and/or address at the time. Alterations, even if made by the sender of the card, will disqualify the card.

Cards should not be sent with award applications. In their place, there should be a list of the cards in callsign order with the details set out in the previous paragraph listed in columns.

This list should be accompanied by a declaration signed by an official of a society affiliated with the WIA, or by two licensed amateurs, reading as follows: "I/we certify that (insert name and callsign of applicant) holds QSL cards corresponding to the above list and that I/we have personally inspected these cards."

Signatories of the declaration should clearly indicate their names, addresses and callsigns.

Applications

Applicants should indicate whether they are WIA members and if so cite their membership number. Where relevant, changes in callsigns and the dates of such changes should be indicated. If the period of on-air activity covered in the application includes a change of QTH of more than 240 km, this should also be noted. If portable or mobile operations are involved, the station's locations should be indicated for each such QSO.

Crossband and mixed mode contacts are not eligible, nor are those made through terrestrial repeaters, from aircraft or sea-going vessels. Rules regarding changes of QTH during the period covered for an application vary for various awards.

Where a fee is payable, this should be sent with the award application.

In cases of dispute, the decision of the Federal Awards Manager and two officers of the WIA Federal Executive on the interpretation and application of these rules shall be final and binding. Notwithstanding anything to the contrary in these rules, the WIA Federal Council reserves the right to amend them when necessary.

Awards Available

Worked All VK Call Areas Award

Known as "WAVKCA" this large, colourful certificate is the WIA's most popular award, particularly with overseas amateurs. There are separate requirements for local and overseas amateurs.

Locals require 77 QSOs, as follows: VK0, 3 from at least 2 different areas; VK1, 5 on at least 2 different bands; VK2, VK3, VK4, VK5, VK6, VK7— ten each, involving at least 3 different bands; VK8, 5 contacts and 2 bands; VK9, 4 QSOs from at least three areas.

The usual rules (see above) regarding crossband, mixed modes, mobile/portable, repeaters, etc, apply.

A past rule allowing VK applicants to make repeat contacts with the same station after 24 hours is hereby rescinded. No repeat contacts made after February 14, 1990, will count.

Overseas amateurs need one QSO with stations in each of VK0, VK1, VK8 and VK9, and three in each of VK2, VK3, VK4, VK5, VK6 and VK7, with no requirements as to bands or QTH.

Heard All VK Call Areas

This is a "heard only" version of the WAVKCA award, available to SWLs; on the same basis as to amateurs, ie confirm reception of 22 stations as specified if overseas, or 77 if resident in VK. The same fees and procedures apply.

WIA DXCC Award

This prestigious award is available to all amateurs who submit evidence of having worked 100 countries, and can be endorsed for various modes and bands. Holders are referred to as "members" of the DX Century Club.

Acceptable countries are determined by the Federal Awards Manager in consultation with the WIA Federal Council. In practice, the WIA list is the same as that issued by the ARRL, subject to the WIA reserving the right to make variations. Currently there are 321 countries on the list.

Having obtained the DXCC award, holders may register subsequent claims for higher totals and these will be published from time to time in Amateur Radio in the form of a ladder. No stickers to indicate these higher totals on certificates are available, however.

Having obtained the basic certificate, applications for recognition of higher totals should be made in multiples of 25 up to a total of 200 (ie at the 125, 150, 175 and 200 marks) and thereafter in multiples of 10 up to a total of 300. At that point applications for additions of single countries are in order.

Should a country be deleted from the DXCC list members and intending members of DXCC will be credited with such country if the date of contact was made before such deletion. Entries on the DXCC ladder typically show the member's tally of current countries and total of current and deleted countries, eg 200/220 — meaning 200 countries currently on the list and an extra 20 which have been deleted at some time, but which were worked before date of deletion.

Starting dates for new countries will generally be the same as those announced by the ARRL, with the WIA again reserving the right to make different decisions.

All claimed QSOs must have been made from the same DXCC country. (This permits a shift from, say VK2 to VK4 during the period covered in an application, but not from VK2 to VK9 or VK0 — see DXCC list for the various DXCC "countries" within Australia.)

WIA Antarctic Award

This is the latest WIA award to be introduced and at present is the only regional award offered by the WIA (meaning that it involves contacts with stations outside Australian jurisdiction).

Applicants must make confirmed contacts with ten amateur stations conducting valid operations in Antarctica. The ten must include stations licenced by at least six different government authorities, and one must be a VK0.

Antarctica is defined as the land mass, including islands and permanent ice shelf below latitude 60 degrees south. (This, incidentally, excludes Heard and Macquarie islands. These are sub-Antarctic, not Antarctic.)

QSOs may be on any amateur band, including the WARC bands, but the usual terms on crossband contacts etc, apply.

QSOs must have been made after 0001 UTC, February 23, 1988. This date was chosen to mark the 75th anniversary of the first two-way radio exchange between the Antarctic continent and the world outside. On February 23, 1913, the exploration team led by the Australian geologist and explorer Douglas (later Sir Douglas) Mawson sent messages to the Australian Governor-General and to King George V from their base at Commonwealth Bay.

WIA 80 Award

This marks the 80th anniversary of the world's first and oldest national radio society, the WIA.

The award is open to all radio amateurs and shortwave listeners, and will operate from November 1st, 1989, until December 31st, 1990.

To qualify for the award those living in Australia (except VK9 and VK0) need to contact 80 members of the WIA.

All others need contact only eight WIA members.

Contacts through ground based repeaters are not permitted, although simplex contacts can be pre-arranged via repeaters.

Each WIA member worked on either the 30 metre, 17 metre and 12 metre bands will count as two contacts for the award.

For the contact to be valid, it must include the WIA membership number of the WIA member involved, and the number must be logged.

This number can either be the one which appears on the WIA membership certificate, or the six-digit number on the address label of the WIA journal, Amateur Radio magazine, sent each month to WIA members.

To claim the award, a log extract must be submitted that includes the callsigns and membership numbers of the required number of WIA member contacts.

The cost is $A5.00 for claimants in VK, P29, ZL and Oceania. All others submit $US5.00, or eight IRCs. (This is the only current award for which WIA members are being charged a fee.)

Endorsements are being given for "first in Canada", "first in New York" and other countries and call areas, as well as for bands and modes.

Worked All States (Australia) Award

Contacts must be made on the VHF/UHF bands, 6 m and above. One QSL from each VK area, 1-8 inclusive, making a total of eight verifications. Endorsements for various bands and modes are available.

The same rules apply irrespective of whether the applicant is a VK or overseas amateur.

VHF Century Club Award

Issued to any VK or overseas amateur who has proof of contacts with 100 different stations on the VHF bands, at least seventy of which must be VKs. Contacts must be made on or after June 1, 1948.

Crossband and mixed mode contacts are not eligible, nor are ones via terrestial repeaters. QSOs involving mobile and portable stations are eligible, providing operators of such stations make all claimed QSOs from the same call area.

If an applicant moves to another call area, new contacts must be made from within a radius of 240 km of the previous location to qualify; otherwise a separate application must be made claiming only contacts made from the new QTH.

Worked All VK Call Areas (VHF) Award

Requires 22 QSOs on VHF bands as follows: one each from VK0, VK1, VK8 and VK9; three each from VK2, VK3, VK4, VK5, VK6 and VK7.

Contacts must have been made after January 1, 198, and rules regarding crossband, mixed mode, repeater, portable, mobile, etc, operations cited above in previous award rules apply.

In addition to the above federal WIA awards, there are scores of other awards offered by VK divisions, zones, clubs and special interest groups. These will be listed briefly in the next and following issues of AR.

New awards are constantly being launched by VK clubs and groups. These are reported regularly in the Awards Column in AR, along with news of new awards available from overseas amateur societies and groups and changes in the rules of the more popular existing overseas awards.

(To be continued in later issues.) **ar**

A Call to all Holders of a Novice Licence

Now you have joined the ranks of amateur radio, why not extend your activities?

The Wireless Institute of Australia (N.S.W. Division) conducts a Bridging Correspondence Course for the AOCP and LAOCP Examinations.

Throughout the Course, your papers are checked and commented upon to lead you to a successful conclusion.

For further details write to:

The Course Supervisor
WIA
PO Box 1066
Parramatta NSW 2124
(109 Wigram Street, Parramatta)
Phone: (02) 689 2417

11am to 2pm Monday to Friday
7 to 9pm Wednesday

REPEATERS

WILL MCGHIE VK6UU
21 WATERLOO CRESCENT LESMURDIE 6076

For years I have wanted someone to write a short column in Amateur Radio reflecting Repeater development and planning throughout Australia, but apart for a brief column written a few years ago by Ken Jewell and Peter Mill, Amateur Radio magazine has largely contained no such comment. Well, if AR will have me I am going to give it a go! I expect writing a regular column every month will be an arduous task, because to be successful it must be a long term commitment. Being involved with Repeaters for almost 20 years however I can see a lot to write about. Such a column could be the focus for communications between all Amateurs involved with Repeaters be they builders or users.

As Technical Officer for The West Australian Repeater Group input from other members within the Repeater Group would be sought along with comment from all Amateurs all round Australia. Packet Radio is a very powerful tool for input to a Repeater column and should be addressed to VK6UU @ VK6BBS. Even though my main interest is in Voice Repeaters, Digital Repeaters will also be included. My phone number is (09) 291 7165.

Strong support for FTAC and the WIA in Repeater co-ordination would be my intention. This is not to say that there won't be a difference of opinion from time to time. FTAC do an enormous job, often in a vacuum of input from Amateurs. Maybe this column can provide some of that input.

Linking

Repeater Linking is the biggest change to Repeaters for many years. The technical means of achieving innovative linking must not be stifled by regulations that are insensitive to a developing technology. It is not an easy task to formulate regulations that must look into the future, but the importance of this futuristic outlook is crucial.

Off Air Linking

Using one of the Repeaters to be linked as one end of the link between the two (or more) Repeaters, must be an option available to Repeater builders. To identify this means of linking the term OFF AIR LINKING has been coined. It may not be the best term, perhaps Direct Linking would be better, but the concept and versatility is important to understand. Several different types of OFF AIR LINKING are possible. The example to follow is the most versatile and the method most used by linked systems in operation at the moment. When cross band linking two Repeaters, placing a Transceiver at only one end of the link so it receives and transmits to the distant Repeater on its normal input-output frequency has many advantages. It is economical in terms of spectrum usage, cost and complexity. The most important of all these factors is complexity. One of the Repeater sites requires no extra equipment at all. An extra antenna, coax run, equipment space and power supply are not always possible on sites that are shared with other services. At the time of writing, OFF AIR LINKING is to be prohibited. The thinking on this option must be reversed. When planning a new Repeater system, simplicity is your number one aim, otherwise the project can be killed because the workload is too great. OFF AIR LINKING does not suit all types of linking situations such as in band linking, but it must be reconsidered.

The recent fine applied to the West Australian Repeater Group for operating a cross-band 70cm to 2m repeater, even though DOTC license such systems in VK4, leaves you to wonder what is fundamentally wrong? After much pondering of this planning nightmare, the only conclusion I have come to is that the problem is with us, the Amateurs. We must find a better crystal ball when formulating regulations. The present regulations on repeater linking were formulated by Amateurs and by-and-large rubber stamped by DOTC. The problem is these regulations contravene the principle code of practice for the Amateur service, that is to be innovative. As charged by DOTC our 70cm to 2m link contravenes the regulations in 3 ways.

1. Link frequency is not on its licensed frequency.
2. Repeaters are cross linked contrary to licensing policy.
3. Retransmitting linked station identification contrary to licensing policy.

Number 2 is strange and must be a mistake by DOTC.

Number 1 is correct as the link is achieved by off air linking, and the sooner this becomes an option the better. The DOTC Officers I have spoken to see no problem with off air linking, particularly as it is spectrum efficient.

Number 3 is also correct as the system does not notch out the ident, but what is the problem? At times we seem to design systems for the lowest common denominator. Surely more than one ident on a repeater is not too much to handle.

The time has come to design repeater regulations that are farsighted. The Amateur at the bottom of this bureaucratic mess is the designer and builder, who often understands the problems and solutions better than the rule makers but! and it is a big but, the bottom line is we the repeater designers and builders are to blame! It is no good blaming the WIA or DOTC. They do a very difficult job with at times little outside help. The WIA office-bearers are a group of dedicated Amateurs who have the prime responsibility of administration combined with providing a focus for discussion. When it come to writing guidelines, input from those concerned, and someone to actually write the guidelines is required.

Be aware of how the system works because this is very important. Comments like "We don't get on too well with the local WIA division so we miss out on information" is no answer. Our communication lines must be drastically improved. A national repeater organization within the WIA must come about. Even a position of repeater co-ordinator filled by someone who knows repeaters would be a great step forward.

It does seem to me that the innovative amongst us are penalized by unnecessary restrictions, and all in a time when we are told that deregulation is the word.

Repeater Idents

Why are there Idents on Repeaters? Is it a DOTC requirement or a WIA requirement? From a repeater builder's point of view they just add a complication and an extra expense. A lot of a Repeater's control circuit is there not only to generate the Ident, but also to provide the correct timing and logic interface.

If the DOTC see Idents on Repeaters as necessary for identifying interference problems, I would like to know how often Idents help. To my knowledge, in VK6 the Ident on a Repeater has never contributed to solving interference problems. Identification is by the Amateur operators using callsigns.

Don't get me wrong, Idents on Repeaters have a place. The point is it should be up to the Amateurs themselves to decide if they wish to personalize their Repeater. Situations such as two Repeaters on the same frequency that are often received due to enhanced conditions is one reason for having Idents.

Idents On Links

If Idents are to remain, and Idents are not to be retransmitted on Repeater link systems, this creates a complication on how to remove the Ident. Yes it can be done. One such way is with an audio notch filter. The point is: does it matter if Idents are retransmitted so that on a Repeater that is linked, you simply hear two Idents? These regulations have considerable effect on Repeater builders. Someone has to design and build all this circuitry.

The WIA is currently examining the question of Idents on Repeaters and link systems. My point is — leave it up to the Amateurs to decide if an Ident is required. **ar**

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH STREET BRIGHT 3741

Last month I mentioned a book called "MORSE CODE — The Essential Language" by L Peter Carron Jr, who subsequently wrote to me to say that he is planning a new edition this year. About the new book he says, "The first three chapters will remain essentially the same. Chapter 4, "Learning to Receive and Send," will be expanded to include additional methods of learning, with expanded exercises. More Morse characters will be added to make a very comprehensive list of characters (even though all will not be in the learning exercises). Chapter 5, "High Speed Operation", will include a brief discussion on a modern computer/transceiver interface unit. These were just in their infancy when the book was first written. Chapter 7, "The Future", will be changed to "Advances in Morse Technology". It will include non-technical discussions on narrow IF and audio filters and advances in other modern day Morse equipment. A new chapter will be added on good CW operating practices and an extensive "Compendium of CW-Related Articles" will be included. Also, quite a few foreign versions of the Morse code will be listed. The appendix will include many updates and will be expanded to list new organizations and new computer code teaching aids. There will be a new "Author's Note" section that will discuss the long-standing code/no-code debate and the recent filing by the ARRL of a petition with the FCC for a no-code license. In short, the book will have many changes and additions. I'm very excited about it. The current edition just went over 8000 in sales, which isn't bad for a book on a subject that's supposed to be "dead".

News From GB/ Europe

TONY SMITH G4FAI

"FOC, the First Class CW Operators' Club, has now joined the EUCW (European CW Association). All major UK and European CW clubs are now members of the association which exists to encourage and promote amateur CW operating. Nervous beginners to CW are reminded that the FISTS (?) Morse Club operates a "phone-a-sked" service for the benefit of all amateurs, not just members of the club. Those about to go on the air for the first time can obtain sympathetic help from an experienced operator who will gently steer them through their first QSO on the key. A list of these operators, with their telephone numbers, is available..."

This seems such a good idea to me that I hope to set up a similar system here in Australia. If you wish to help other budding Morsiacs on the air please write and tell me your name, call and phone. I will set up a database, probably regionally based, and then anybody can simply send me a SAE for a print-out of possible contacts for help.

Tony also reminded me about an article in the Autumn edition of Morsum Magnificat; "Kitchen Table — Home Made Key" by Barrie E Brokensha, ZS6AJY. I won't print the entire article because I am not sure of the copyright but using a piece of hacksaw blade, some curtain track, perspex and self-tappers, Barrie has made large quantities of these keys with appropriate audio oscillators for his pupils learning the code. The sharp point of the self-tapper has proven a reliable contact in place of normal silver or gold. Students sit around a table and make contact with each other using their sets, with all speaking prohibited. Barrie has promised them that when they are proud holders of their tickets and callsigns, he will substitute the audio oscillator with a QRP RF oscillator, plug in a simple dipole antenna and let them loose on the bands!

The following letter comes from

GARETH DAVEY, VK2ANF

"About 10 years ago I was working as a technician at OTC's Coast Radio Station at La Perouse (VIS), and under test was a new Philips SITOR unit for radiotelex contact with ships. (Back then, AMTOR was just a gleam in Syd VK2SG's eye.) Anyway tests were conducted on a variety of HF duplex frequencies, and it was not uncommon to have our shore-based receive frequencies jammed while working a ship. I don't know why they were jammed; perhaps someone out there didn't recognise the new-fangled SITOR signals and thought they were doing everyone a favour by interfering with them, or maybe they just wanted the test to fail. The Coast Station operators always blamed it on "the Russians". Russians or not, the jamming created a lot of problems for those 1st-generation SITOR signals, and it always fascinated me that Mr Philips included a switch on his unit marked TOR-CW, with a jack for a morse key on the back. One day while I passed by the SITOR console, one of the seasoned Coast Station operators was having a conversation with the morse key on the SITOR equipment. I had had an amateur licence for a few years and thought I could pick out signals from the mud, but no matter how hard I tried all I could hear on the speaker was a very loud, broad-spectrum jamming signal. This operator though could actually read CW through the interference, and was discussing with his shipboard counterpart what frequencies they would go to to try again: an absolutely amazing demonstration of CW's maximisation of power/Hz, and the brain's ability as a bandpass filter."

By now many of you will have heard on the grape vine that we will have a new trophy for the Novice winner of the Novice Contest CW section each year. I have collected some donations toward the trophy which amount to $100, and the WIA is going to put something toward the total so that the yearly interest will pay for a new trophy for each winner. Thanks to those who made donations, and to Bill Roper and the executive for their support of the code. The name of the trophy? "The Clive Burns Memorial".

If you wish to make a donation, please send it to Bill Roper at the federal office of the WIA. (Don't forget to tell him what it's for.)

Some months ago, George Craggs, VK2AYG, sent me his Morse learning kit for a squiz. I would have liked to follow his advice and try it on six raw beginners, but here in the sticks it was hard to find one! I listened to the tapes and read the instructions and made an effort to try it on one of my kids, who are all interested, but have trouble finding the time, (as usual). The kit consists of four cassettes and an instruction/check book (not cheque), and is excellent if you have a slight knowledge of the code, or perhaps if you have not used the code for a number of years since getting your ticket. However for learning the letters you have to drill yourself from the printed page.

George's system has an advantage in that you are not required to write anything down, but I think actually learning the code from a more basic cassette is a required first step. If you think differently, or want to re-learn your forgotten code, have a go at this kit, it is extremely good for practice as well. George's address is 56 Oatley Park Ave, Oatley, NSW 2223. Write and let me know how you get on.

73 for this month. **ar**

Have you advised the WIA Executive office of your new callsign?

Use the form on the reverse of the Amateur Radio address flysheet.

AMSAT

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON 5074

National Co-ordinator
Graham Ratcliff VK5AGR

Information Nets
AMSAT Australia
Control: VK5AGR
Amateur check in: 0945 UTC Sunday
Bulletin commences: 1000 UTC
Primary frequency: 3.685 MHz
Secondary frequency: 7.064 MHz

AMSAT SW Pacific
2200 UTC Saturday, 14.282 MHz
Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional Broadcasts.

AMSAT Australia Newsletter & Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has about 270 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia addressed as follows:

AMSAT Australia, GPO Box 2141, Adelaide 5001.

The Newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of $10 per item to AMSAT Australia together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services send a SASE to Graham.

Further Note On InstantTrack

Omitted from the notes given in the last issue, the author of the program Franklin Antonio N6NKF has "donated" it to AMSAT, so that all income from it goes towards future amateur satellites. In the case of copies distributed by AMSAT-Australia, 50 per cent is forwarded to AMSAT and the remainder retained by the VK organisation.

ZRO Tests Via OSCAR 13

The ZRO Memorial Technical Achievement Award Program (ZRO test) has been reactivated in the last few months. Since the time schedules so far do not favour VK operators, please contact Graham VK5AGR if you wish to participate, so that he can negotiate with the organisers for a suitable time-slot.

This activity is a test of operating skill and equipment performance. During a typical ZRO run, a control station will send numeric code groups using CW at 10 wpm. At the beginning of the run, uplink power is set to match the general beacon downlink strength. This is level "zero". The control operator will send and repeat a random 5-digit number, then lower his uplink power by 3 dB (half power) and repeat the procedure with a new random number. This will continue to a level 27 dB below the beacon (level 9). A participating listener monitors the downlink signals until he can no longer copy the numbers. For further details of this activity, Graham can provide a brochure issued by the organisers.

New JARL Satellite JAS-1b

Harry Yoneda JA1ANG advises the JAS-1b Launch Window to be 01 Feb 90 0125-0200 utc.

JAS-1b was built at the same time as Fuji-Oscar-12 as a backup, and has the same communications configuration. However there are some significant differences, which should allow it to provide a more reliable service than its predecessor.

Gallium Arsenide solar cells have been fitted, and since these have a much higher energy conversion efficiency to the silicon cells used on FO-12, the spacecraft will have about 11 watts of power generating capability at the start of its life. It is expected that with this capacity the CPU and memory will be able to run continuously, even with an eclipse rate of 33 per cent.

JAS-1b will be placed into a much different orbit to FO-12. It will be launched with OS-1b which is a Maritime Observation Satellite and is expected to be inserted into a sun-synchronous orbit with an inclination of 99 degrees and a period of 103 minutes (altitude 900 km). However, this orbit is eclipsed for 33 per cent of each orbit and consideration is being given to obtaining a more favourable period by raising the apogee of JAS-1b by about 300 km. This could be achieved by

OSCAR 13 News

Proposed operating schedules:

	31 Jan 90 - 21 Feb 90	22 Feb 90 - 27 Mar 90	28 Mar 90 - 09 May 90
Mode B	MA 000 to 160	MA 000 to 020	MA 000 to 160
Off	nil	MA 020 to 090	nil
Mode B		MA 090 to 160	
Mode JL	MA 160 to 190	MA 160 to 190	MA 160 to 190
Mode S	MA 190 to 200	MA 190 to 200	MA 190 to 200
Mode B	MA 200 to 255	MA 200 to 255	MA 200 to 255
Omnis	MA 235 to 75	MA 235 to 090	MA 235 to 075
Proposed attitude changes:		22 Jan 90 to 210/2 07 May 90 to 180/3	

Eclipses: 27 Feb 90 to 21 Mar 90 between MA 31 and 65 from 13 to 89 minutes

OSCAR 10 Attitude Prediction

JAMES MILLER G3RUH

Estimated attitude data for AMSAT OSCAR-10, extrapolated from last known attitude late 1986.

Date		Alon	Alat	Sa	Ill(%)	Slat	Slon
1989 Dec	10	41	-18	-19	95	-32	274
1990 Jan	7	38	-17	10	99	-45	305
1990 Feb	4	35	-15	38	79	-42	343
1990 Mar	4	32	-14	66	40	-27	10
1990 Apr	1	28	-12	84	11	-6	28
1990 Apr	29	25	-10	58	53	17	43
1990 May	27	21	-8	31	86	36	63

Please note that on OSCAR-10 the linear polarised OMNI antennas are in use and best signals are to be expected if the SQUINT angle is in the area of 90 degrees.

burning fuel remaining in the second stage of the H-1 launch vehicle after separation from MOS-1b. If this is achieved, the effect would be that about 150 days from launch the eclipse rate would drop so that from day 300 to 470 there would be no eclipses.

A further change from FO-12, is that the new satellite will use a ring type turnstile antenna for uplink receiving. This is expected to result in a more stable uplink signal received from ground stations. For transmitting, the digital and analogue systems will share the same antenna. This has resulted in the addition of a hybrid circuit (HYB) and phase shifters, instead of two antenna power dividers and two sets of transmitting antennas.

The specifications for JAS-1b and a schematic diagram are reproduced below.

73s from Maurie VK5EA

Specifications of JAS-1b

Launch And Orbit

1. Launch (scheduled)

Time: February 1990, day is not fixed
Launch vehicle: H-I (2-stage) rocket
Launch site: Tanegashima Space Centre, National Space Development Agency of Japan NASDA)

2. Orbit (planned)

slightly elliptical polar orbit, with 900 km perigee
Period: 106 minutes
Inclination: 99 degrees

Satellite Specifications

1. Dimension

Size: 26-face polyhedron measuring 440 mm across and 470 mm in height
Weight: Approx. 50 kg

2. System configuration

Analog and digital transponder in mode J (uplink: 144 MHz, downlink: 430 MHz)

3. Attitude control

Satellite attitude will be maintained by using the torque generated by interaction of two permanent magnets with the earth's magnetic field.

4. Thermal control

Passive control using paint and thermal insulation.

5. Planned service life: 3 years

System Specifications

1. Beacon and telemetry

JA beacon: 435.795 MHz nominal frequency, ca. 100 mW power, CW or PSK*
JD telemetry: 435.91 MHz nominal frequency, ca. 1 W power, packet in PSK
*Also capable of AO transmission

2. Telemetry

Satellite Activity For September/October 1989

1. Launches

The following launching announcements have been received:-

Int'l Number	Satellite	Date	Nation	Period min	Apg km	Prg km	Inc deg
1989 -							
077A	USA 46	Sep 25	USA	1413.4	35791	35774	5.0
078A	MOLNIYA 1-76	Sep 27	USSR	11h42m	38960	650	62.8
079A	COSMOS 2046	Sep 27	USSR	92.8	431	412	65.0
080A	INTER-COSMOS 24	Sep 28	USSR	115.9	2492	505	82.6
080B	MAGION 2	Oct 03	Czech	115.90	2494	504	82.5
081A	GORIZONT 19	Sep 28	USSR	23h54m	35753		1.3
082A	COSMOS 2047	Oct 03	USSR	89.5	357	178	67.2
083A	COSMOS 2048	Oct 17	USSR	89.4	270	248	62.8
084A	STS 34	Oct 18	USA	90.5	323	295	34.3
084B	GALILEO	Oct 18	USA	Jupiter probe			
085A	USA 47	Oct 21	USA				

2. Returns

During the period seventy six objects decayed including the following satellites:-

1982-026A	COSMOS 1345	Sep 27
1982-121A	COSMOS 1427	Oct 05
1989-012A	COSMOS 2002	Oct 15
1989-075A	COSMOS 2044	Sep 29
1989-076A	COSMOS 2045	Oct 02
1989-084A	STS 34	Oct 23

3. Notes

1989-075A COSMOS 2044 with two monkeys and other objects landed 165km south of the town of Kustanay, USSR, on September 29 1989.
1989-084B GALILEO was deployed from the orbiting STS 34 on October 18 1989.

Satellite Activity For October/November 1989

1. Launches

The following launching announcements have been received:-

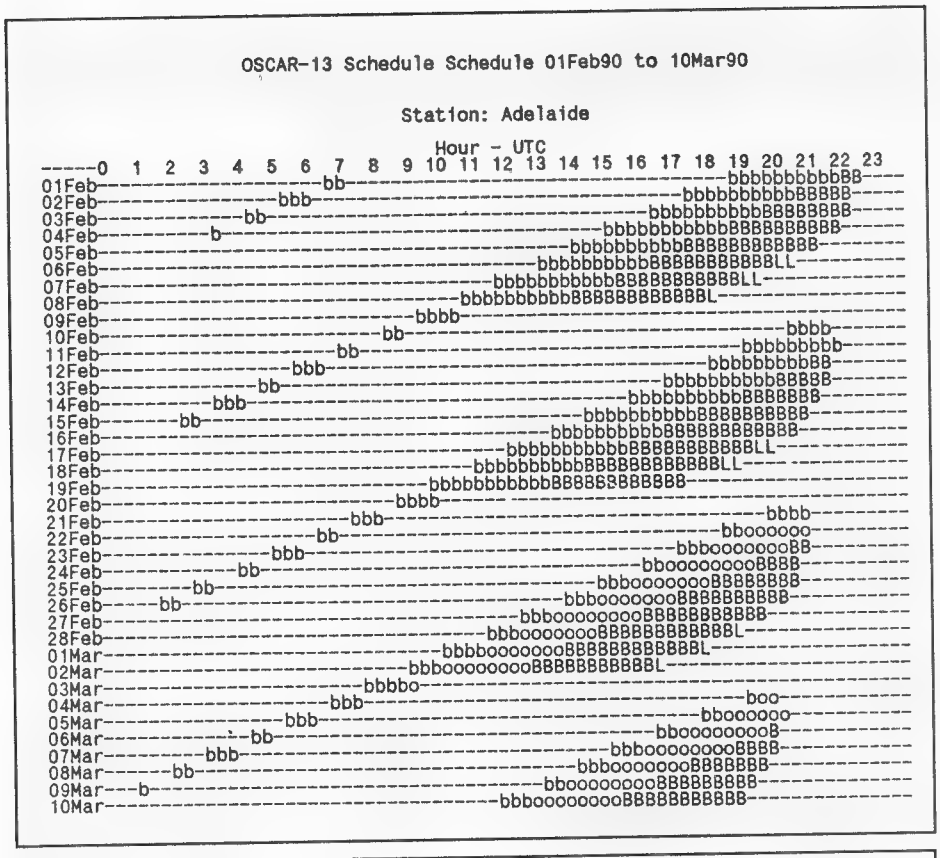
Int'l Number	Satellite	Date	Nation	Period min	Apg km	Prg km	Inc deg
1989 -							
086A	METEOR 303	Oct 24	USSR	109.5	1228	1191	82.6
087A	INTELSAT 6A	Oct 27	ESA				
088A	COSMOS 2049	Nov 17	USSR				
089A	COBE	Nov 18	USA				
090A	STS 33	Nov 23	USA				

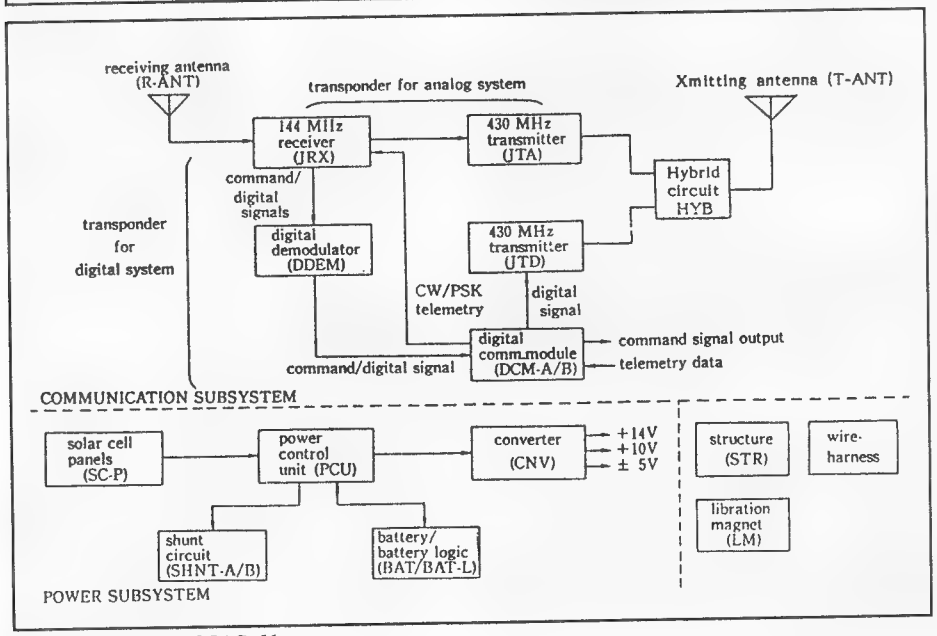
2. Returns

During the period seventy six objects decayed including the following satellites:-

1966-057A	COSMOS 122	Nov 14
1967-039A	COSMOS 156	Oct 23
1978-119A	COSMOS 1064	Nov 12
1985-050A	COSMOS 1662	Nov 16
1989-082A	COSMOS 2047	Nov 21
1989-083A	COSMOS 2048	Oct 26

BOB ARNOLD VK3ZBB





Block diagram of JAS-1b

Remember to leave a three second break between overs when using a repeater

Support the WIA in order to protect amateur radio frequencies at WARC 92.

CW telemetry: 12 analog data items
33 status items
PSK telemetry: 29 analog data items
33 status items
3. Commands: Equipped with real-time program command function.

4. Transponder
Frequencies and modes (see the table below) are similar to those of FO-12. The analog system (JA) consists of an inverted heterodyne transponder, with a band width of 100 kHz operating with a mode J, of uplink 145 MHz and downlink 435 MHz.
The digital system (JD) functions as a mailbox using the AX.25, link level protocol. Stations currently using FO-12 will be able to use JAS-1b without any modifications to equipment.
(1) Analog system transponder inversely heterodyned linear translator, Uplink pass-band: 145.9 to 146.0 MHz
Downlink pass-band: 435.9 to 435.8 MHz
Transmitter output: Approx. 1W PEP
Bandwidth: 100 kHz (3 dB bandwidth)
Uplink EIRP required: About 100 W
(2) Digital system transponder
Store- and-forward packet communication, using AX.25 link level protocol, version 2.
Uplink frequencies:
145.85 MHz, 145.87 MHz, 145.89 MHz, 145.91 MHz
Bi-phase Manchester code, on FM signal, with a bit rate of 1200 bps.
Uplink EIRP required: About 100 W
Downlink: 435.91 MHz/NRZI/PSK, 1200 bps.
Transmitter output: About 1 W
5. Antennas
144 MHz receiving antenna (R-ANT):
Ring turnstile antenna mounted at bottom of side panels.
435 MHz transmitting antenna (T-ANT):
turnstile antenna mounted at the top of satellite (shared by analog and digital modes)

	polarization	gain
R-ANT:	circular	+0.5 dBi max.
T-ANT:	circular	+4 dBi max.

6. Power supply
(1) Solar cells (planned)
Cell: Gallium arsenide
Size and quantity: 2x2 sq-cm and 1x2 sq-cm, over 1300 cells.
Power output: More than 10 W, (BOL)
(2) Battery
Cell type and quantity: 11 series-connected NiCd cells (rectangular)
Capacity: 6 AH
(3) Voltage converter
Bus voltage: +11 to 18 V (14 V average)
Regulated voltages: +10 V, +5 V, -5 V
Efficiency: Better than 70%
(4) Power control functions
Bus voltage upper limit control (full-shurt), and UVC function to disconnect load when batter terminal voltage drops.

The above specifications were provided by courtesy of JARL. **ar**

SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

Activity on HF became rather hectic in the third and fourth week of December, when two significant international events, suddenly erupted. The first one was the US invasion of Panama, in an attempt to capture military strongman, Manuel Noriega, and take him back to the States to answer drug-smuggling indictments. Relations between the US and the Panamanian military sharply deteoriated, following Noriega's annulment of the presidential election results last year, when his candidate was soundly trounced.

Noriega's thugs began harassing the substantial American population, who are mainly engaged in work around the Panama Canal Zone. There was also a sizeable US military contingent to protect the strategic gateway between the Pacific and Atlantic Oceans. The Americans acted swiftly and took most by surprise. The USAF frequencies of 8993 and 11179 kHz were carrying heavy traffic after the invasion commenced, as the transport aircraft ferried extra troops into Panama.

There are no external HF broadcasters in Panama, so I had to mainly rely on VOA and other international stations to catch up with events there. The major maritime station in Panama City — HPP did continue operating on 13.075 on ARQ, but went QRT two or three days after the invasion. The VOA in Washington came up unexpectedly in Spanish at about the same time as the launching of the invasion, to explain why the US had intervened.

But it was the tragic events in Romania which pushed the Panamanian crisis into the background until after Christmas. The first inkling I had was a report on Radio Deutsche Welle of a massacre in a Romanian city I never knew existed, that alerted me to keep my ears tuned to news coming from the Balkans. Radio Bucharest has provided good signals to the Pacific at 0645 UTC on 15335 kHz for some time now, and I kept monitoring it. The programme output has been reflective of the personality cult that surrounded Nicolai Ceaucesku and extremely boring. Yet when the revolution erupted violently, there was a swift, dramatic turn in the tone of the broadcasts. On Saturday December 22nd, the normal English output was suddenly replaced with multi-lingual appeals for help to put down resistance from the secret police. It was on a very poor-quality audio feed reflecting the uncertain situation at the time.

Several European broadcasters extended their Romanian language programming to cater for the need of listeners within that nation, as well as in the Moldavian Republic of the USSR (Moldavian and Romanian are the same language) to be kept informed of the momentous happening in Bucharest and Timisoara. The BBC came up on 15115 kHz on the 22nd at 1230 at 30 minutes notice.

Then, on the 26th of December, came the English report about the execution of Ceaucesku and his wife. The tone had changed in four days from praising him to the skies, to denouncing his as a tyrant equal to Hitler. Incidentally, I have yet to receive confirmation of my report to R Bucharest in the middle of last year. I guess now with the substantial alterations within Romania, that a fresh report on signals and programming at present would be advisable.

Looking at the last quarter of 1989 in retrospect, we were witnesses to an epoch ending and a new dawn emerging as the artificial division of western and eastern Europe disintegrated. First, it was Radio Polonia, then Radio Berlin International, Radio Prague and finally Bucharest. All have altered their programming to accommodate the changed political climate. Also the World Service of Radio Moscow has brought details of the changes within the USSR over the same period. All these alterations have breathed fresh air into international radio.

I would advise that you keep an ear to the Baltic area and to the Nordic countries, for there could be significant developments over the next six months. Also, the central region of Latin America is likely to the next flashpoint, with scheduled elections this month in Nicaragua. Managua has been heard in English floating around 6 MHz exactly around 0500 UTC. Well, that is all for February. Next month, I hope to be reviewing the 1990 World Radio TV Handbook. Until then, the very best of listening and 73. **ar**

Prefix Changes

New prefixes are being used by some radio amateurs operating from within the USSR.

Estonia (UR) can use ES, Latvia (UQ) has been heard under YL, and Lithuania (UP) may now use LY.

ar

DON'T BUY STOLEN EQUIPMENT

CHECK THE SERIAL NUMBER AGAINST THE WIA STOLEN EQUIPMENT REGISTER FIRST.

ALARA

JOY COLLIS VK2EBX
PO BOX 22 YEOVAL 2868

This year, for the first time, a DX-YL is winner of the ALARA Contest. Congratulations to Aimee FK8FA for a great achievement. Congratulations also to the runner-up Bev VK6DE, and not least of all to our Florence McKenzie Trophy winner, Marjorie VK2VME.

Our thanks to all who participated and helped to make the 1989 Contest so enjoyable.

At the time of writing Marilyn VK3DMS is very busy preparing certificates for those who have won them. These will be despatched as soon as possible.

ALARAMEET September 1990

With the holiday period behind us and most kids back at school (to the relief of their mums, who can now actually enjoy a quiet "cuppa") 1990 is well under way. Certainly not too soon to start planning for the ALARAMEET in Dubbo on September 29/30th. Organisation for this event is well in hand, and it promises to be a very enjoyable weekend. If you are considering joining us drop Maria VK5BMT a line for details.

BYLARA

BYLARA have a new Secretary, Sandie G1LXM and Newsletter Editor Kay GOKTC. They are interested in receiving any news items from overseas YLs for inclusion in the Newsletter.

BYLARA Contest

This will be held on:

Thursday 22nd February, 1900 to 2200 UTC and Saturday 24th February, 1000 to 1300 UTC.

Reminder: YL-OM Contest

Phone: 10.2.90 — 1400 UTC to 12.2.90 — 0200 UTC.

CW: 24.2.90 — 1400 UTC to 26.2.90 — 0200 UTC.

Alara Contest November 1989 Results

No	Callsign	Name	Points	Certificate
1	FK8FA	Aimee	964	Top overall & FK ALARA member.
2	VK6DE	Bev	705	Top Phone, VK ALARA member & VK6 ALARA member.
3	VK3CYL	Kim	682	VK3 ALARA member.
4	VK3KS	Mavis	673	
5	KB5HTH	Sue	371	USA non-member.
6	VE7YL	Elizabeth	339	VE ALARA member.
7	G4EZI	Diana	315	G ALARA member.
8	VK2EBX	Joy	262	VK2 ALARA member.
9	WA3HUP	Mary Ann	240	USA member.
10	VK6YF	Poppy	237	
	VK3DYL	Gwen	237	Tied Score.
11	VK7HD	Helene	231	VK7 ALARA member.
12	VK3DML	Margaret	222	
13	WB3CN	Ruthanna	154	
14	VK5BMT	Maria	152	VK5 ALARA member.
15	VK5CTY	Christine	149	
16	VK5YL	Denise	140	
17	DJ6US	Walli	131	European ALARA member.
18	VK4AOE	Margaret	129	VK4 ALARA member.
19	VK3DVT	Valda	119	
20	VK2VME	Marjorie	116	Top Novice YL, VK Notice & Florence McKenzie Trophy.
21	VK3XF	Les	112	VK — OM.
22	ZL1BIZ	Elva	107	ZL ALARA member.
23	VK5ANW	Jenny	106	
24	VK4VR	Val	104	
25	GOEIX	Rita	97	
26	ZM2AGX	Dawn	96	
27	DF2SL	Anny	90	
28	L40018	Charles	84	Top SWL.
29	G4RFR	Jo	62	G non-member.
30	VK7RY	Edgar	54	
31	VK3DYF	Bron	43	
32	YU7LF	San	28	European OM.
33	ZS2AA	Iris	25	ZS Non-member.
	VK3ALD	Len	25	Tied Score
	Check logs received from:			
	VK3XB	Ivor.		
	VK3DMS	Marilyn.		

Here And There

Nancy VK2NPG and OM Dale, currently touring Australia, attended the VK5 Division Christmas Party while in Adelaide. They were late arriving due to car trouble, but had a great time once they finally arrived.

Val VK4VR represented ALARA at the Gold Coast Hamfest late last year.

Errata from last month's ALARA News: Clarrie VK3UE has been an amateur radio operator for 41 years, and Joyce VK2MI for 42 years, not 40.

Until next month,

73/33. **ar**

Help stamp out stolen equipment -

Always include the serial number of your equipment in your Hamad

CLUB CORNER

MEG BOX VK5AOV SECRETARY
BOX 401 BLACKWOOD 5051

On Saturday 25 November, 1989, the Adelaide Hills Amateur Radio Society conducted the first amateur radio examinations to be held by a body other than the Department of Transport and Communications.

The following examinations were taken

6	Full Theory
3	Novice Theory
3	Regs
2	Receiving at 10 wpm
2	Receiving at 5 wpm
1	Sending at 10 wpm
1	Sending at 5 wpm

The club wishes to congratulate the 2 persons who gained their full theory — the only successful candidates on this occasion.

These examinations were authorised for trial purposes under the new syllabus, which is not "official" until 21st February, 1990, and the Department will not issue a certificate or licence before that date.

Examinations Officer, Marshall Emm, reports that he was pleased with the way the examinations went and at this stage proposes that the next examination will be held on the first Saturday in March, 1990. Application forms may be obtained from the Secretary, AHARS Inc, Box 401 Blackwood 5051 and should be returned no later than 2 weeks before the examination date. The fee is $10 for non-members (no matter how many exams sat for on the day), and free for members. Note: Membership of AHARS is $10 pa at present.

Monty Nell And VK2JQ Remembered

D S THOMPSON VK2BDT

Members of Goulburn Amateur Radio Society were delighted when advice was received from the Department of Transport and Communications that they had been authorised to use the call sign VK2JQ for their Club station. The call sign is of great significance as it was the one used by the late Monty Nell who was the Patron of the Society for many years before he became a "silent key" in mid 1989. The Society thought that it would be a fitting manner in which to preserve the memory of Monty and his contribution to the hobby of "ham radio".

Monty Nell was a very keen amateur operator, he was first licenced in the early 1920's, when his call sign was OA2JQ, Australian "hams" later had VK as the prefix to their call signs denoting that they were Australian stations. VK2JQ has been held continuously

by Monty until the time of his death. It is thought to be the oldest call sign to have been held by the same operator:

Amateur Radio has seen a great many changes since Monty was first licensed. In the early days, no ready made "black boxes" were available, "hams" in those days had to make their receivers and transmitters from whatever they could scrounge or improvise. Today's "hams" have access to very sophisticated equipment and are using all the most modern techniques to communicate with their fellow "hams" throughout the world.

In Goulburn, Society members are right up with all the latest developments. The Society has had a VHF repeater station operating for a number of years and is just about to put a UHF repeater on air. A further project is planned for 1990, this envisages a VHF repeater to be installed in the Bateman's Bay-Moruya area which will be linked by UHF to the Goulburn VHF repeater. This installation will make it possible for stations, both fixed and mobile, in the cost area from Bega to Nowra to talk through the Goulburn repeater located on Mt Grey to other stations in the area, and as far afield as Mittagong, Canberra and Young. This will be the first such linking of repeaters from the Coast to the inland and, it is hoped that when time and funds permit, it can be extended to link repeaters further inland.

Funds to purchase the necessary equipment for the project have been raised by members of the Society and members propose to join together and pool their technical knowledge and skill to construct the new repeater and links.

New members are always welcome to the Society whether or not they hold Amateur Operator licences. The Society meets every month on the second Thursday at SES Hq. Assistance is always available to enable new non-licenced members to gain their "ham" licence. **ar**

QSLs FROM WIA COLLECTION (22)

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139 PHONE (059) 64 3721

Benin — A Rare DX Country

The People's Republic of Benin (to give its full name) is a narrow north-south tract of land lying in West Africa. To the west lies Togo, to the east, Nigeria and to the north, Niger Republic. It's rather a small country almost exactly half the size of Victoria, but for its size it is one of the most densely populated areas in all Africa. (Its population is about four million.)

Portuguese explorers established a trading post and a slave centre on Benin's shore in the seventeenth century at what was to become Benin's capital, Porto Novo. This Portuguese name (Newport) still persists, although Benin had been a French colony for many years. For a period of twenty-two years it was an autonomous community, although it didn't receive independence from France until 1960. France became interested in Benin late in the nineteenth century, when the local King of Porto Novo requested protection of the French from other tribes. The country became a French Protectorate in 1892. The country was then known as Dahomey and it became part of what was French West Africa.

The country seems to be sandwiched between Togo and Nigeria. In fact, it is so narrow that many Beninese travel to Lagos (in Nigeria) or to Lome (in Togo) on their weekend shopping excursions.

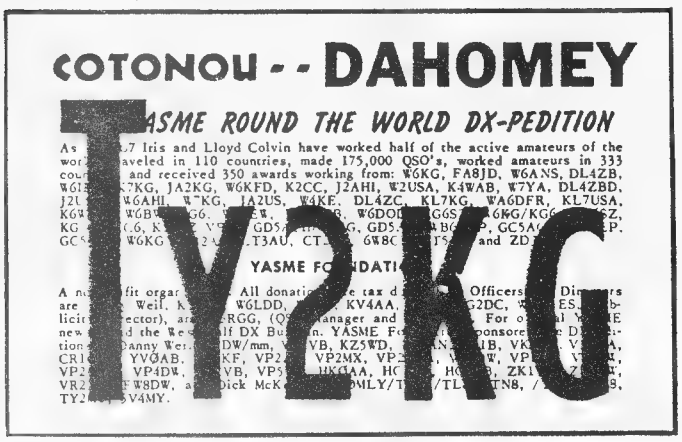
A series of different governments ran the country after independence came on 1st August 1960, but the political situation remained very unstable, no fewer than nine changes of government taking place during the first twelve years of independence. Finally in 1972 after a military revolt, a military government took charge. Lenin-Marxism became the official ideology, and in 1975 the country's name was officially changed to Benin. The reason for the change of name was (according to the military leader at the time) "an attempt to wipe off the stains of colonization".

Benin, lying on the south side of the western "Bulge" of Africa and facing the Gulf of Guinea to the south, is not altogether a tourist's paradise. Water is not potable and must be boiled. Even vegetables and fruits bought at the local markets must be treated before consumption. The tropical climate also can be a real challenge to Europeans, but this does not seem to have prevented the incursion of several Dx-peditions into this rather rare DXCC country.

Before the war the prefix allocation of TJA-TZZ had been allocated to "France and Colonies and Protectorates" but it was never used. Instead the old letter F allocation followed by an identifying second letter was used eg FA= Algeria, FG= Guadeloupe and so on. In fact, Dahomey was not recognized by the ARRL as a "country" until 1960, when it operated under the now deleted call-sign FF8 (French West Africa). Before the independence of the French West African colonies, the prefix FF8 included not only Dahomey but the colonies of Ivory Coast, Mali, Voltaic Republic, Niger, Mauritania and Senegal. All of these countries assumed their own individual call-signs in the latter part of 1960, Dahomey from 1st August 1960, the prefix allocation being from the block TYA-TYZ. The majority of Dahomey prefixes commence with TY but the WIA collection also contains a few examples of a QSL with the prefix TYA. (This was the International DX Foundation assisted DXpedition by K4YT in 1981-2 (the call was TYA11). Gus Browning's QSL TY3ATB (1965) and the Yasme Foundation's DXpedition QSLs TY2MY (1962) and TY2KG (1967) are also in the collection.

TY2KG

As mentioned above, this QSL was from a Yasme Foundation sponsored DXpedition. Possibly the most well-known operators of this organization are the husband and wife team of Lloyd and Iris Colvin who have trav-


COTONOU - - DAHOMEY

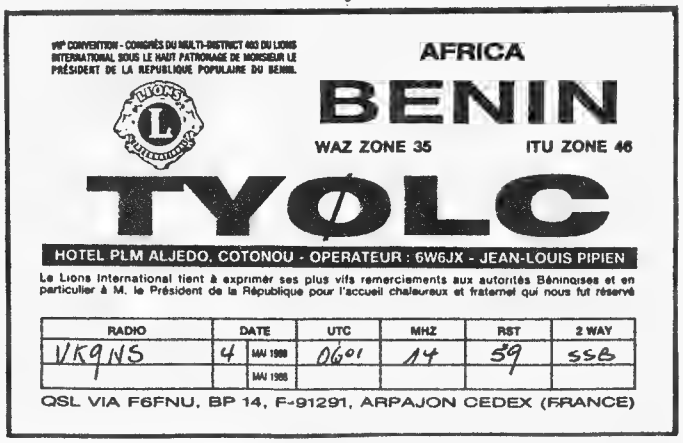
YASME ROUND THE WORLD DX-PEDITION

As [illegible] Iris and Lloyd Colvin have worked half of the active amateurs of the wor[illegible] traveled in 110 countries, made 175,000 QSO's, worked amateurs in 333 cou[illegible] and received 350 awards working from: W6KG, FA8JD, W6ANS, DL4ZB, W6I[illegible] K7KG, JA2KG, W6KFD, K2CC, J2AHI, W2USA, K4WAB, W7YA, DL4ZBD, J2U[illegible] W6AHI, W7KG, JA2US, W4KE, DL4ZC, KL7KG, WA6DFR, KL7USA, K6W[illegible] W6BW[illegible]G6, W[illegible]EW, [illegible]G, W6DO[illegible]G6S[illegible]6KG/KG[illegible]6Z, KG[illegible](C6, K[illegible]VE[illegible]GD5[illegible]G, GD5[illegible]BC[illegible]P, GC5A[illegible]P, GC5[illegible]W6KG[illegible]2A[illegible].T3AU, CT[illegible]6W8C[illegible]TS[illegible] and ZD[illegible]

YASME FO[illegible]NDATI[illegible]

A n[illegible]fit organ[illegible]e tax d[illegible] Officers[illegible] Di[illegible]rs are [illegible] Weil, K[illegible] W6LDD, [illegible] KV4AA, [illegible]G2DC, W[illegible]ES[illegible]b-licit[illegible]ector), ar[illegible]RGG, (Q[illegible]anager and [illegible] For o[illegible]al Y[illegible]E new[illegible]d the We[illegible]lf DX Bu[illegible]n. YASME Fo[illegible]ponsore[illegible]e D[illegible]-tion[illegible]anny We[illegible]DW/mm, V[illegible]VB, KZ5WD, [illegible]N[illegible]IB, VK[illegible]V[illegible]A, CR1[illegible]YVØAB. [illegible]KF, VP2[illegible] VP2MX, VP2[illegible]W, VP[illegible]V[illegible]M, VP2[illegible] VP4DW. [illegible]VB, VP5[illegible] HKØAA, HC[illegible]HC[illegible]B, ZK1[illegible]Z[illegible]W, VR2[illegible]F W8DW, a[illegible]Dick McK[illegible]OMLY/T[illegible]/TL[illegible]TN8, /[illegible]8, TY2[illegible]5V4MY.

TY2KG


19th CONVENTION - CONGRÈS DU MULTI-DISTRICT 403 DU LIONS INTERNATIONAL SOUS LE HAUT PATRONAGE DE MONSIEUR LE PRÉSIDENT DE LA RÉPUBLIQUE POPULAIRE DU BENIN.

AFRICA

BENIN

WAZ ZONE 35 ITU ZONE 46

TYØLC

HOTEL PLM ALJEDO, COTONOU - OPERATEUR : 6W6JX - JEAN-LOUIS PIPIEN

Le Lions International tient à exprimer ses plus vifs remerciements aux autorités Béninoises et en particulier à M. le Président de la République pour l'accueil chaleureux et fraternel qui nous fut réservé

RADIO	DATE		UTC	MHZ	RST	2 WAY
VK9NS	4	MAI 1988	0601	14	59	SSB
		MAI 1988				

QSL VIA F6FNU, BP 14, F-91291, ARPAJON CEDEX (FRANCE)

elled in more than 100 countries and worked amateurs throughout the entire world. The date of this QSL was November 1967 when the country was still called Dahomey. It resulted from a QSO by the late Alex Swinton, VK2AAK (VK3AAP) whose widow, Mona, VK3BRE kindly donated Alex's QSLs to the collection. The QTH of the Dahomey station was Cotonou. This city, situated only about twenty kilometres from the capital, is the country's largest and also its chief port.

TYØLC

The special prefix TY0 is a comparatively new one. This QSL dated May 1988, resulted from a QSO between DX-er Jim Smith VK9NS (on Norfolk Is) and Jean-Louis Pipien. It is an especially assigned call since the suffix LC stands for "Lions Club". The Lions International was holding at this time their VIIth Congress under the patronage of the President of the Republic. Their thanks to both the President and the Beninese authorities are expressed (in French) on the front of the QSL card. French (the country's official language) is almost the only European language spoken these days, English being quite uncommon. Even today, the country is very dependent upon the investment of French capital into the economy.

TY9ER

This QSL also resulted from a DXpedition, this time by Ed Richmond W4MGN. The station situated also in Cotonou, was on the air from 10-13 July 1980. Ed mentions that the pile-ups were horrendous and we can appreciate the reason why. Over 2000 contacts were made on 10, 15, and 20 metres during that short period. The QSL recipient was another top DXer, Barry VK5BS whilst operating mobile in Queensland.

If you like to play a part in building up the WIA QSL collection and to save something for the future, would you please send a half-dozen (more if you can spare them) QSLs which you feel would really help the collection along.

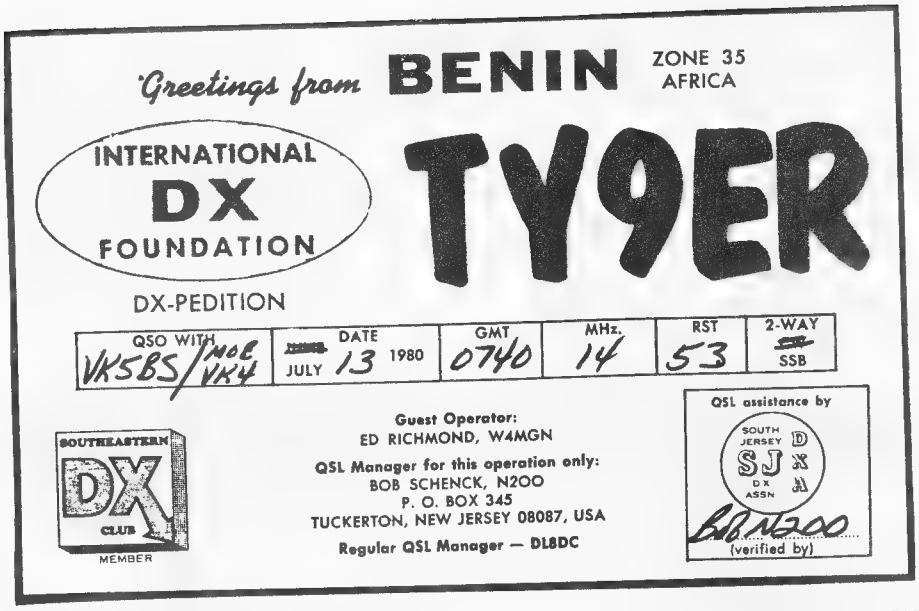
All cards are appreciated, but we especially need commemorative QSLs, special event stations QSLs, especially assigned call QSLs (eg VK4RAN), pre-war QSLs, unusual prefixes, rare DX and pictorial QSLs of not so common countries. Could you help? Send to PO Box 1, Seville 3199, or phone (059) 643721 for card pick-up or consignment arrangements for large quantities of cards.

Thanks

The WIA would like to thank the following for the kind donation of QSL cards (Supplementary List):

Vic	VK5AGX	Arthur	VK3VQ
Frank	VK2QL	Bruce	VK3BM
Jim	VK9NS	Jack	VK3JA
"Ike"	VK3OW	Stan	VK3TE

Also the South African Radio League (SARL)



Congratulations

The Wireless Institute of Australia congratulates well-known DX-er Robin Lyon, VK6LK of Margaret River, WA as the winner of the 1989 DX QSL Contributors' competition. We feel he deserves this praise since he has remained at the top of the list for most of 1989 with some very generous (and rare) QSL contributions. Robin is to be awarded a suitable inscribed memento by the WIA in appreciation of his find effort.

DX QSL Contributors' ladder

(See "Amateur Radio" March 1989, page 55 for details.)

As stated in the December issue of "Amateur Radio", we have started a "new" ladder from Jan 1990. Those top DXers Jim Smith, VK9NS and Frank VK2QL have shot to the front of the field in no mean way with truly excellent QSLs. Despite the fact that it is becoming rather difficult to add to the WIA's prefixes, Jim sent in no fewer than 31 prefixes from quite rare DX spots together with 48 recently-issued Stateside prefixes that were new to the collection. It was a very fine effort. Old Timer, Frank VK2QL not only supplied some excellent prefixes, but also a few countries new to the collection including the rare (now deleted) country, Ifni.

Contributions

From Jim VK9NS:- AZ4F (Argentina) AZ5ZA (South Orkneys) FH4 (Mayotte) FJ (Saint Martin) FP5, FR5, FS9, FW4, S92 (St Tome), WH8, V3, TY0, J39, J37, J27 (Djoubouti), IY4, I04, HT5, NH4 (Midway), RD7, 4V2 (Haiti), 3G87PAX (Chile), RX4, P36, (Cyprus), 8P9, 802, 6W6, 6V6, 6V2 (Senegal) 6F2 (Mexico) 5T0, together with no fewer than 48 newly-issued (one letter suffix) Stateside call signs.

From Frank, VK2QL:- Geyser Reef, Ifni and Bouvet Island (LH4C) JX2, 9V0, NG0, KF3AB (Fletcher Ice Island), KG61, PJ6, PZ3, YR4, YQ4, UY4, WS3SKY (Skylab), SW0, XL1, WI6ITU, 4C5 (Mexico), 4U2ITU, XE4, KL6ITU, 8SM0, XJ2, Special Calls include: LZ5A, N6V, 8J1ITU, 8J1AD (Antarctica), R0C, U0Y, 3Z50PZK, 4N2BR, YU7LAA, HB1KU/HE, WO5ITU.

From Bruce, VK3BM:- YN8, 4A0, 3C8, HC3, CW0, Special Calls: I1IIC, DL0WU, WS0SUB/0 (Submarine Call).

From Vic; VK5AGX:- NR1, WG8, NC8, Special Calls: JA7RL (JARL), GB75LOA.

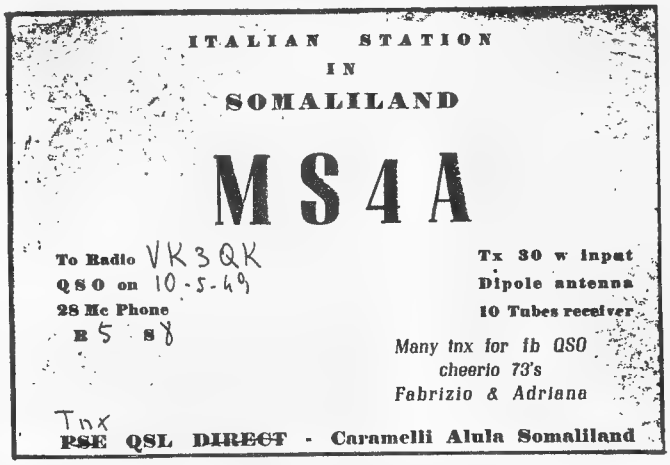
Present State Of The Ladder

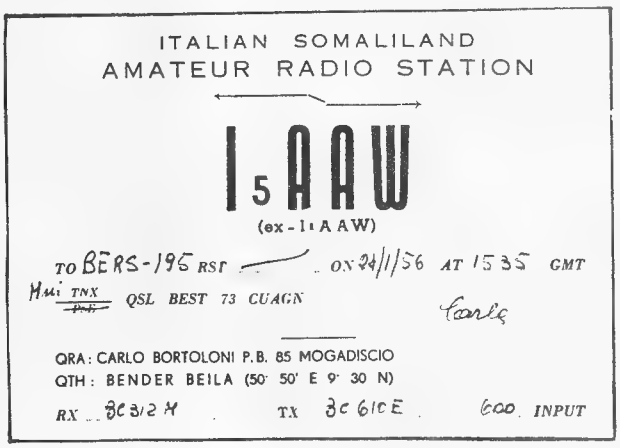
Jim	VK9NS	158 points
Frank	VK2QL	149
Ray	VK3RF	24
Bruce	VK3BM	13
Barry	VK5BS	10
Vic	VK5AGX	8

This must be regarded as a pretty good effort when one considers that the WIA Collection must be one of the largest collection of prefixes in the world. It is no easy task to add to it.

Please do not forget that information on QSLs, DXpeditions and the like is available upon request from the curator. Also photostat copies of both pre-war and modern QSLs are available free of charge to any writer on the history of amateur radio. **ar**

In the January 1990 issue, Murphy decided that it was time to give Ken Matchett VK3TL some attention — by eliminating the entire illustrations from his QSL article! (Which, believe it or not, survived three proof-reading sessions!) Our apologies to Ken. The missing illustrations are shown below.




ITALIAN SOMALILAND
AMATEUR RADIO STATION
I5AAW
(ex-I1AAW)
TO BERS-195 RST ON 24/11/56 AT 1535 GMT
Hui TNX QSL BEST 73 CUAGN
Carlo
QRA: CARLO BORTOLONI P.B. 85 MOGADISCIO
QTH: BENDER BEILA (50° 50' E 9° 30 N)
RX BC312M TX BC610E 600 INPUT

EDUCATION NOTES

BRENDA EDMONDS VK3KT FEDERAL EDUCATION CO-ORDINATOR
PO BOX 565 MT WAVERLEY 3149

Information about the exam generation system is starting to accumulate. Papers produced using the program have been successfully used as actual examinations in VK5. A few people have passed on comments on the papers produced on a trial basis, and I have used the program to generate two papers from each bank. I would appreciate any more comments or information as it becomes available. Unless anyone feels strongly against sharing their findings, I will try to pass on information as it reaches me.

The generation program at present does not seem to me to be the complete answer. (I do not think it was intended to be.) It is obvious that each paper will require some degree of editing. The diagrams are not included on the disc, so will have to be patched in. More importantly, some questions may have to be replaced either because one may inadvertently answer the other, or because there are too many from a particular subsection. No formula seems to have been applied to decide the spread of questions from within any particular section, so the distribution reflects the number of questions on each topic in the bank. As I have said before, it will be to our advantage if we can produce extra questions to be added to the bank to even out this distribution.

I have not yet had a chance to try the editing on the computer. It should not be difficult to replace an existing question with one from the bank, or to make minor alterations to a question. I hope it is also possible to alter the order of the questions, as at present each paper is produced with the questions in the order in which they occur in the bank. I think re-arrangement might have to be done manually.

I do not recommend trying to produce papers in a hurry. I have not yet tried to measure the time it will take to produce a satisfactory paper. It will depend to some extent on the operator's skill of course, but each Theory paper I ran took about 12 pages of printing without any spaces for diagrams. At a very rough estimate, I would expect to spend an hour reading a paper and deciding modifications needed, (there are a few typographical errors which will need to be amended), up to an hour making the modifications, and another hour putting in diagrams and photocopying.

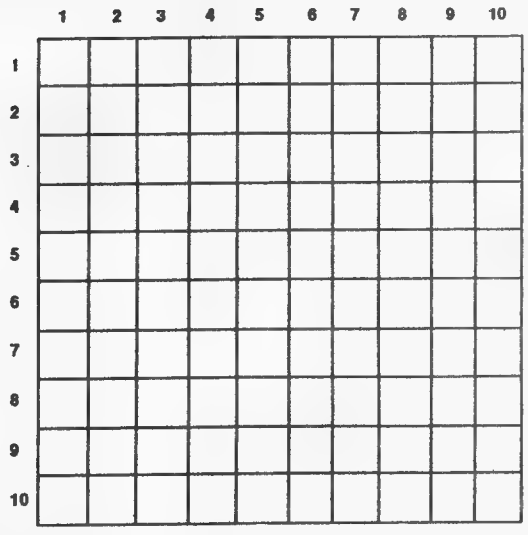
The exams this month will be "the end of an era". For the last time I can wish a large group of candidates luck and success. Remember, READ THE QUESTION, and ALL the answers. I look forward to hearing you on air in the future. **ar**

Morseword No 35

Solution on page 61

Across
1 Namely
2 Headgear
3 Brand of computer
4 Close tightly
5 Picture
6 Chant
7 Cabbage
8 Begin
9 Agreements
10 Performance

Down
1 Shakespearian king
2 Comforts
3 Admonish
4 A small drink
5 Suits
6 Carried
7 Arid
8 Abbot
9 Succeeds
10 Sprinkle



Audrey Ryan © 1989

DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

Newcastle Earthquake

Just before 10.30 on Thursday 28th December, much of VK2 felt the shake. Much of Newcastle, in particular the Central Business District and surrounding suburbs bore the worst of it. Large areas lost power or had it turned off, and most communications went out. Within a few minutes the local Amateurs were activated. Links out of the area were established. Within a couple of days additional personnel were brought in from outside the Newcastle region to relieve the locals as well as provide additional facilities. The Amateur operation was maintained for almost a week.

A more detailed report will appear in later issues of "Amateur Radio", but at this stage thanks must go to the Amateurs and WICEN personnel who were involved.

1990 Annual General Meeting

It is getting round to that time again for the annual election of Council and the Annual General Meeting. Reports should be submitted to the Secretary by mid February, and those interested in serving on Council should obtain a nomination form for the office.

Field Days

You are reminded that the Central Coast ARC field day will be held at the Gosford Showground on Sunday 18th February. Details of the program may be heard on the Divisional broadcasts. Please note there is no morning broadcast on the 18th. Instead it will be held on Saturday evening the 17th. The Sunday evening will be held as usual.

The Urunga Convention will be held over the Easter weekend in April, and details should appear in Club Corner in a future issue. The Oxley Region Field Day is over the long weekend in June.

Joint Meeting

A joint meeting of the Presidents of VK2, 3 and 4 was held in Sydney in the break between Christmas and New Year. Many subjects were covered and it is hoped that they may become a regular feature. While there are the inter Divisional meetings at the Federal level, the discussions are more often national rather than State matters.

Club Members should be aware of proposed changes in regional representation via the affiliated club structure. If not, ask to see the recent QST postings if a copy has not been included in your local club newsletter.

Divisional Office Fax

A dedicated line has been installed for the fax in the office. (02) 633 1525. It is on line at all times. Why not use it for general inquiries, broadcast items, bookshop inquiries etc.

ATV Meeting

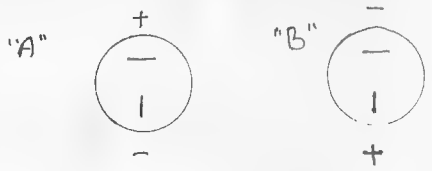
You may have noted the report from the Sydney ATV Group in last months "AR". There are a lot of pockets of ATV interest in VK2. Several groups have had repeater licences, including, Taree, Newcastle, Central Coast, Gladesville, Sydney and Wagga. It has been suggested that a meeting be convened for all interested parties to get together and discuss and plan future activities, including the best utilization of available frequencies. An error in the callbook left out details of most of the ATV repeaters which may lead some to think there is little or no VK2 activity. This meeting is expected during February.

February Exam

The best of luck and good wishes to all who will be sitting the last DOTC exam on February the 20th. After that date all (except certain special) exams will be conducted by the Amateur Radio Service. For details within VK2 contact Terry VK2UX, the Divisional Education Officer, via the office for details of groups conducting exams or to tell him if your group will be conducting them.

Technical Tapes

Before each Sunday broadcast there is a quarter hour technical segment. Requests are received from time to time for copies or transcripts. Copies of the tapes are available if requested through the office. There is a small charge to cover tape and delivery costs. While on the subject of technical matters? or how not to use 3 pin plugs and sockets for extra low voltage, there is a 2 pin system made by the various companies in the electrical field. It is the "T" plug, designed for "extra low voltage". Many of you will know it and several use them. The question I wish to put to you is the following. "What is the correct or preferred polarity to wire it?" There is no standard set out as far as I am aware, but because there are two ways (or is it more?) of wiring it up, there are often problems of reversed polarities, which has about the same effect on a rig as 240, if there is no reverse polarity protection. So which of the layouts below is the preferred or more common? Written replies to "Plug Polarity" PO Box 1066 Parramatta NSW 2124.



New Members

The December intake of new members was the largest for some time and a warm welcome is extended to all:

R W Allsopp	Assoc	Balgowah
D S Bird	Assoc	Terry Hills
M J Blackmore	VK2XOF	Baulkham Hills
G R Brice	VK2GRB	Thornleigh
W F Brittain	Assoc	Wahroonga
S J Burgess	Assoc	Cherrybrook
G Cotterell	Assoc	Gordon
G R Dalglish	Assoc	Picton
G B Dent	Assoc	Tamworth
T Floro	Assoc	Macquarie Centre
C H Gibbons	VK2MHR	Austinmer
J A Green	VK2PJG	Bray Park
P J Hollis-Watts	VK2YJW	Raymond Terrace
R Harrison	VK2ZTB	Balmain
A K Hore	VK2TQB	Goonellabah
E Horman	VK2KEL	Auburn
S J Jacobs	Assoc	Narrabeen
W R Knowles	VK2DJE	Gulburra Beach
L H Kocken	Assoc	Castle Hill
A Luckman	Assoc	Ryde
R J McKosker	VK2DOT	Niagara Park
R P Obra	Assoc	Parramatta
C Pradier	Assoc	Albury
W Rannard	VK2YKZ	Georges Hall
R Raven	Assoc	Tathra
C E Rowell	Assoc	Cremorne
A Runiewicz	Assoc	Auburn
S Scott	VK2FUB	Morisset Park
L Seidl	Assoc	Carlton
B B Singh	Assoc	Herbersham
R K Sommerville	VK2URK	Woodburn
J D Stewart	VK2MHU	Wagga Wagga
N J Stewart	VK2GS	Lindfield
D M Stocks	VK2ZDS	Toongabbie
J Szbowski	VK2XJJ	Kingswood
S Szybowski	VK2KEU	St Marys
J Wallace	Assoc	Caringbah
M J Walton	Assoc	Hornsby
O Zacovich	VK2DKR	Tempe

ar

VK2 WICEN NEWS

MORTON WILLIAMS VK2DEX

Bungonia Exercise

WICEN (NSW) Inc wishes to advise that the simulated cave rescue exercise for 1990, will be held as usual at the Bungonia caves on the second weekend in March, which, this year, is the 10 — 11 March.

Wicen's primary role in this exercise is to provide a safety net during the simulated cave rescue operations.

All meals are provided for a modest cost to operators to provide an enjoyable weekend, free from camp cooking.

If you are interested, contact Morton Williams, VK2DEX QTHR, or on the Sydney Wicen net on Thursday nights at 2100 local time on channel 7150 or 8275, before 1st March, as numbers must be known by then for catering purposes. **ar**

VK3 NOTES

JIM LINTON VK3PC

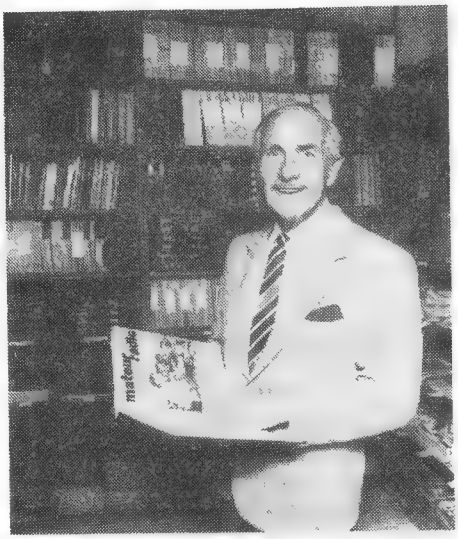
VK3BWI Weekly Broadcast

The aim of the broadcast, which starts at 10.30am each Sunday, (see WIA directory page 3 for frequencies) is to inform listeners of events, happenings and issues affecting our hobby. It has hundreds of regular listeners and is one of the media used by the WIA Victorian Division to communicate with its members. The broadcast has news items, editorial comment, reports of events and issues. Regular listeners will be aware it also has occasional items of a controversial nature, and a sprinkling of humour, trivia, and amusement.

The forward looking broadcast team late last year gave thought to how the broadcast could be improved on its already successful format. Two new segments were chosen and expected to begin this month. The first is a report on Amateur Television activity to be supplied by Melbourne ATVer Doug White VK3BOW. The other innovation for the broadcast is plain-language ionospheric predictions which will be of use to the casual or ardent user of the amateur HF bands.

Reference Library

After considerable effort, the Division's library has now been placed in new bookshelves. It is not a borrowing library, but



Amidst the neat bookshelves in the WIA Vic Div reference library is Ken Matchett VK3TL showing obvious and deserved pride in re-establishing the library.

exists as a reference library and membership service.

Among the periodicals held by the library is a complete set of Amateur Radio magazine from 1933. Other magazines include QST from 1926, CQ from 1950, RSGB Radio Communication, Electronics Australia (formerly Radio and Hobbies), 73 Magazine, Amateur Radio Action, Wireless World, Ham Radio, and NZART Break In. Also held is an incomplete set of ARRL Handbooks over the past 60 years, and the RSGB Handbooks. Those wishing to trace old callsigns will find the callbook collection a help. Several historical textbooks — Admiralty Handbooks, and Yearbooks of Wireless Telegraphy — give a glimpse into the early days of wireless. Members are most welcome to use the library for research, and a photocopying service is available at a nominal charge. The WIA Victorian Division Council expresses its appreciation to Ken Matchett VK3TL for his efforts in re-establishing the library. **ar**

5/8 WAVE

JENNIFER WARRINGTON VK5ANW

Last month, you may remember, I gave you some of the history of VK5WI and the Sunday morning Broadcasts, 40 metres in particular. I suppose that it goes without saying that without volunteers there would be no Sunday morning Broadcasts. Chris VK5PN who coordinates the volunteers roster informs me that things are getting pretty desperate on some frequencies. On 20m in particular, there could be some weeks when there is no relay, simply because of the lack of volunteers. If we could get 4 operators on each frequency each would only have to do it once a month — is that such a great hardship? I believe that Jack VK5AHI has been a great help this year helping out on various HF bands, when needed.

6m (53.1 AM) has just lost two of its long time stalwarts. Lance VK5ZBC has done 165 relays since he started in 1981; and I don't know how many Andrew VK5AAS has done, but I know that he also has been doing it for many years. Our grateful thanks go to both of you for all the time and effort you have put in. I understand that we have one replacement on that band, our thanks to Bob VK5KZZ who has volunteered.

10m is looking "healthier" than it has for sometime thanks to Reg VK5RR who has volunteered to help VK5s UH, AH, and BAR. You might remember that last month I mentioned that Reg VK5RR was doing the Sunday morning B/Cast in March 1947! (Perhaps this will give some other former operators the incentive to return.)

Perhaps you would prefer to put on the originating Broadcasts from the BGB. There are currently six operators who do this, but as Clarry VK5KL said on the 160m report this year, some of the are not as young as they were and it would be nice to get some "new blood" on the team. 80m would also like to see some new faces but if you would like to volunteer for ANY band, please let Chris VK5PN or a member of Council know — you will be welcomed with open arms!

To those volunteers who are already doing a great job, there isn't room to mention you all, but we thank you sincerely none-the-less.

One volunteer who always seems to be there when help is needed is John VK5NX. Here are just a few of the jobs John does. He is a B/Cast Relay Operator on 80m, he is one of our Auctioneers at Buy and Sell nights, and he is "Technician in Charge" of the radios and tape recorder for the broadcasts, in the transmitter room. For many years John has organised the drinks for the Picnic and Christmas Social, and has helped organise the races for the kids etc. Four times a year he makes sure that we receive the ICS Award at the right time, and has at times been Guest Speaker, and Judge of homebrew gear when we have needed one. This doesn't include his time on Council when he was Treasurer for several years.

John will be retiring later this year, so he may not always be around when we need him, with this in mind, we felt that it was a good time to say "thank you" to John by awarding him the ICS Award at the December meeting. Thanks John, it's not going to be easy to fill your shoes!

Diary Dates

Feb 27th Ian Hunt VK5QX will speak on "Mobile Installations"

16 - 18 March Clubs' Convention at Ridgehaven Primary School. (Hopefully by now we have all your Agenda Items and names of delegates!) **ar**

VK6 NOTES

JOHN HOWLETT VK6ATA

Club Conference has been arranged by the Peel AR group and is destined to take place on the 17th February at a site some 30 km South of Mandurah. It has been a few years since the last meeting and should be an interesting weekend. Some WIA council members will attend so get ready with suggestions and questions you always wanted to ask.

Equipment Bank is being set up as a service to all WIA members and will come on stream soon. A secure cabinet has been built by Doug VK6ASM at NCRG Club shack, and is being stocked up with common pieces of test gear to start the project moving. Equipment can be borrowed before and after the Sunday morning news relay, or at NCRG Club meeting held on the 2nd and 4th Tuesday of each month. Commencement of the service will be announced on the news broadcast and represents another tangible reason to renew your WIA membership and support those who support you.

Intruder Watch Graham VK6RO recently became WA Co-ordinator and deserves our congratulations but even more, Graham needs information on intruders. A cassette tape is available to help you identify the many strange sounds heard on the bands, some of which are not intruders but amateur computer driven modes. Learn the difference and expand your knowledge of the hobby. SWLs are most welcome, contact Graham on (09) 451 3561 for the full story.

Under 21 Club: rumour has it that a net is being organised by some of the younger operators and sounds like a great idea. We look forward to more news on this in the near future.

New Year Resolution: why not try a new aspect of the hobby this year? Perhaps fox hunting, send some CW, join 10-10, work towards DXCC or chase an award. Learn about packet, AMTOR or Satellite Communications. Work a contest, build a kit or homebrew a project. Above all, be active on air and occupy the valuable air space we all take for granted. 73.

Notice Of AGM

It is hereby notified that the Annual General Meeting of the Western Australian Division of the Wireless Institute of Australia will be held on the 17th April 1990 following the General Meeting which commences at 8pm. The Meeting will be held at the Westrail Centre, East Perth.

Agenda

1. Consideration of the Council's Annual Report
2. Consideration of the Financial Report
3. Consideration of other Reports
4. Election of Office Bearers, viz. President and Vice President of the Division and seven other Councillors.
5. Election of two Auditors.
6. Appointment of a Patron
7. General Business which has been duly notified.

Notices of motion for the AGM must be received by the Secretary not less than 42 days prior to the meeting and must be signed by at least three members.

Nomination of a candidate for election to Council must be received by the Secretary in writing not less than 42 days prior to the meeting with an intimation that such candidates are willing to act. A candidate may submit a statement not exceeding two hundred words outlining his or her case for election and experience. Each nomination shall be signed by two members proposing the candidate. Candidates must possess a current amateur licence.

Proxies

Any financial member entitled to vote may appoint a proxy, who must also be a financial member entitled to vote, to speak and vote on his/her behalf. Each such proxy must be in the hands of the Secretary prior to the meeting and be in the following form:-

I ..... a member of the Institute hereby appoint ..... also a member of the Institute to act for me as my proxy and in my name to do all things which I myself being present could do at the meeting of the Institute held on

Signed .....

Witness .....

Date ..... **ar**

VK7 AGM

J A ROGERS VK7JK

The Annual General Meeting of the Tasmanian Division of the Wireless Institute of Australia will take place on March 24th 1990 at a venue to be notified later on the Divisional Broadcast. In order to ensure circulation of Notices of Motion to all members, these must be in the hands of the Divisional Secretary at PO Box 1010, Launceston, 7250 by the 9th February, 1990. Nomination Forms for Council must be submitted to the same address by the 3rd March.

Both Nominations and Notices of Motion must be in writing.

Proxy Forms should be in the hands of the Secretary prior to the commencement of the meeting.

Northern Branch Annual General Meeting is to be held on the 14th March 1990. The venue for this meeting is also to be advised later.

Nominations for Branch positions close the day before the meeting, ie the 13th March.

The Annual General Meeting of the Southern Branch of the Tasmanian Division of the Wireless Institute of Australia will take place on the first Wednesday in February — that is, the 7th at 105, Newtown Road, Hobart at 8.15 pm.

The Annual General Meeting of the North Western Branch of the Tasmanian Division of the Wireless Institute of Australia will be held on 13th February.

The venue will be the Penguin Hotel and the time, 7.30 pm. **ar**

INTRUDER WATCH

GORDON LOVEDAY VK4KAL FEDERAL INTRUDER WATCH CO-ORDINATOR
AVIEMORE RUBYVALE 4702

So to the second instalment of the Monitoring Lessons...

All modulated or keyed signals occupy a finite bandwidth, some choice is offered in designating the frequency of emission. In some cases the choice is obvious, in others it is more arbitrary. Reference should be made to the following table to ensure uniformity in Monitoring System reports. I will take the most encountered signals first...

1.	NON	Measure freq @ zero beat in CW or SSB mode.
2.	PON	Measure Centre frequency of the Emission.
3.	A1A	Zero beat in CW or SSB Mode.
4.	A2A	Zero beat of Carrier in CW or SSB Mode.
5.	F1B	Centre freq of Emission ie half between the zero beat of the two Carriers.
6.	F7B	Centre freq of 4 carriers, sounds like 2 equally strong RTTY signals close together.
7.	J3E	Resolution frequency of the modulation.

These modes are featured on the monitoring service tape available from your National Co-ord at NO charge — a C60 cassette is sufficient. Many other modes will be included on the tape. More modes will be described next month, with explanations. It is not appropriate to dictate absolute standards here, because the equipment in use by monitoring stations varies. Recommendation 7 (D) of an IARU Region 1 Div Conference states "For frequency measurement made solely to investigate the occupancy of frequency channels, the permissible error as applied to exclusive Amateur Bands be +/-210Hz @ 7 MHz; +/-420Hz @ 14MHz +/-630HZ @ 21MHz & +/-840HZ @ 28MHZ". These remarks should be kept in mind when making frequency measurements. Extracts used are by permission of IARU monitoring system. **ar**

SILENT KEYS

We regret to announce the recent passing of:

Mr J F Magee	VK1FM
Mr E H Cox	VK1GU
Mr A T W Griffiths	VK2FO
Mr P C Smith	VK2DNE
Mr A D Costello	VK3YT
Mrs J L Sutherland	VK3NLO
Mr Jonathan Marshall	VK3KPQ
Mr I C Truelove	VK8AP

Jonathan Marshall VK3KPQ

Jonathan (19) was driving home on Thursday 7th December, when his car left the Hume Highway and struck a tree. He had been playing his part over the previous four days with WICEN providing communications for the Great Victorian Bike Ride.

Jonathan was a likeable, enthusiastic teenager whose love of amateur radio was contageous; it was part of his life. Over the last few years he did his best to enthuse other youngsters with his involvement in the Jamboree On The Air.

He was conscientious and honourable; once he had committed himself he could be depended upon, and he was generous to a fault with both his time and equipment.

Last year Jonathan spent a year in Israel on a scholarship for leadership training. Since his return he has been deeply involved in helping to bring the best out in other young people, as well as continuing with his studies.

We grieve with his mother, father and two sisters, and all those who knew him, at his most untimely death.

Alan Weeks, VK3CAW
VK3SCM, Malvern District Scouts

REPEATERS
• ADDITIONS,
• DELETIONS,
• ALTERATIONS.

HAVE YOU ADVISED THE WIA OF CHANGES NEEDED TO THE REPEATER LIST?

OVER TO YOU

All letters from members will be considered for publication and should be less than 200 words.
The WIA accepts no responsibility for opinions expressed by correspondents.

Membership In The "Nineties" "To Be or Not To Be ..."

I have read with interest and some degree of consternation over the past twelve months or so, the various letters concerning the continuing increase in the cost of WIA membership.

I had no intention of taking part in the discussion, but the introduction of the WIA 80 Competition, "I am a member of the WIA because", has prompted me to consider and evaluate my own reasons for being a WIA member. All too often writers have taken a negative stance, being "concerned" with the cost while high-lighting how few benefits are available to them. Very rarely do these writers contribute anything worthwhile and any positive aspects seem to be deliberately overlooked.

The only negative aspect I wish to bring forward is to comment on how pathetic the afore-said arguments are when held up to honest scrutiny. Even the current cost of $65 is really miniscule when compared with the benefits available to members. I say available because they are there, whether or not we need to use them. $65 equals $1.25 per week! Peanuts, surely! Most of those who criticize the fees and who are smokers or drinkers will gladly spend $20 per week on their habit but to ask for $1.25 to protect and improve their hobby is "daylight robbery". What hypocrites!

The stark reality of the situation is that one cannot expect 1990's services and benefits at 1970's prices! After all, the same standard of car which cost me $4000 in 1975 now costs $25000! So because cars are now so costly will I give them up and walk? Of course not!

And for any amateur who has anything from $1000 to $10000 worth of equipment in his shack and who can't honestly afford $1.25 per week to be a WIA member, I'm sorry to say, it is time for him or her to sell up and take up picking up sea shells for a hobby.

On a more positive note, I, personally, would like to see WIA membership fees as an automatic part of annual licence fees. Thus every licensed amateur would be a WIA member. All would enjoy the many benefits, assistance and protection, legal and otherwise, necessary in this time of over-zealous Councils and regulating bodies. With such a system and the subsequent increase in member numbers, the per member cost would be significantly reduced, possibly to the $40 area. This, plus the annual licence fee could still be below $65, our magical $1.25 per week, a sum which, to my mind, is readily affordable by anyone. I fully appreciate the possible complications of this idea but I am sure that such complications are not insurmountable. Such a system would produce a stronger liaison with DOTC and a much healthier radio communications system overall.

To "Amateur Radio" readers, this epistle may well be wasted as most are already WIA members. Maybe these points could be conveyed to all those amateurs who are not as yet members. I hope that common decency, the Aussie spirit of a "fair go", and the manly (person-ly?) trait of shouldering one's responsibilities will see a huge increase in membership and genuine sharing of the load into the 1990's.

In conclusion, it will be very apparent that WIA membership means enough to me to put apathy aside and take up my pen in support of an excellent organization, the sole concern of which is the protection and improvement of the marvellous hobby which we all hold so dear.

Donald A Thornley VK5NOD
Membership no 232394
14 Anthony Street Mount Gambier 5290

Packet Comment

I read with interest the contribution by Peter Broughton in the December issue of Amateur Radio, "An Introduction to Packet Radio". The Packet Radio mode is increasingly popular with amateurs both in Australia and overseas. Australian amateurs are well versed in the latest technology and in some cases advancing it. So it is appropriate that more information should be published to keep amateurs informed as to the latest developments.

However I would like to make one comment on Peter's article. He says that an IBM compatible computer is essential to use the system "to present day standards". That is not strictly correct. If he is referring to the fact that Yapp software will only run on an IBM compatible, I can tell your readers that an even more advanced program — GEEPAK Ver 1.30- will do all that the IBM compact/Yapp/TNC combination will do and more. It is designed to run with a Microbee disc-based computer including the "Computer in a Book"

and requires only a simple Beepak Modem to generate and demodulate the packet tones; it has dual port VHF/HF capability and all for less than half the cost of the IBM compact/YAPP/TNC set-up.

I agree with Peter that it is most desirable to join a user group to get a proper introduction to Packet and to keep in touch with all the latest developments. In this regard I would mention the Australian Amateur Packet Radio Association (AAPRA), an entirely voluntary association which has pioneered many of the Packet Radio developments in Australia. AAPRA introduced the popular C=PAK modems with software TNC-emulation for the Commodore family of PC's and the BEEPAK package for the Microbees. It is a convenient source of imported TNC's. Any surplus from these transactions is used to purchase equipment for supply...without cost...to Radio Clubs to establish digipeaters on strategic mountain tops and in metropolitan areas.

AAPRA has about 400 active members in all Australian states as well as oversea; it publishes an information sheet, DIGIPEAT, to keep members informed of the latest developments in packet radio world wide, including equipment mods. It does not operate any BBS or mailboxes — there are more than enough of those already — but in introducing data highways on UHF, and the ROSE networks, it will hopefully make life easier for the average packet operator.

So if you are interested in the broader picture and latest in Packet, contact AAPRA at the address below.

John Jefferys VK2CFJ
Hon Sec AAPRA
59 Westbrook Ave Wahroonga 2076

CB, Amateur, "Ham" and PR

It was gratifying to note the quick response by the WIA and many amateurs to the erroneous statements made on a recent "Investigators" programme on ABC TV (7/11/89).

However, while the media and the general public still remain confused by the difference between Amateur Radio and Citizen's Band radio, may I offer the following considerations:-

As Amateur Radio operators we must first put our own house in order if we are to clear up this confusion.

This could be best done by more energetic publicity from the WIA through Divisions and Clubs to the individual amateur, explaining the differences between the two services to the media and the public.

Another point of confusion exists with the use of the ridiculous appelation, "HAM"!

Since very few of us wish to be classified as a "Lump of Pork" or a "Mug Actor", it should be completely eradicated!

Likewise, "HAM Radio" sounds like a pig farmer's communication network!

A standard R/T voice procedure for amateurs has been in existence for many years. We should use it, NOT the "long winded" and often incorrect CB jargon. The "Q" code was intended for CW NOT phone; in any case some newcomers misuse it — QRX does NOT mean wait and the proword ROGER should be used instead of QSL (no thanks, I don't want a card!).

Clubs should appoint a publicity officer to keep the local media informed of the club's aims and activities, and this will assist in attracting new members.

When amateurs assist in civil emergency operations, these events must be publicised, BUT ONLY responsible WICEN officers should deal with the media and then in the form of press release statements which are NOT to be altered (blue pencils banned!).

As licensed radio operators we should operate our stations according to the Regulations and above all with a friendly and courteous regard for the rights of others.

Ted Gabriel VK4YG
PO Box 245 Ravenshoe 4872

VCR TVI

I am experiencing a serious TVI problem concerning VCR's, and I wonder if a reader of AR may be able to help me.

The situation is as follows;

A. My transmitter has a maximum CW output of 100 watts. My antenna is a five-band trap vertical in ground-plane configuration. SWR no greater than 2:1 on bands on which I operate.

B. I cause no TVI whatsoever on any TV channel/Ham band combination, when receiving TV direct or when using my VCR as the TV tuner.

C. Nor do I create TVI problems when recording on the VCR (ie, the VCR recording is "clean").

D. However, when playing back any tape through the VCR I cause TVI at TX output levels as low as 5 to 10 watts. 10 metres is clear of the problem, but the situation worsens with TVI on 80 metres being the worst.

I have tried two low-pass filters in the TX coax with absolutely no reduction of the problem. (I did not believe it would anyway.) I have tried high-pass filters at the TV antenna input. Still no change. Also wrapping the TV coax several times through a large ferrite core achieved nothing. Neighbours' VCRs are also affected. I hope this is a common problem and someone out there has the cure. If so, please let me know the antidote.

Ray Turner VK2COX
6/276 Bunnerong Rd
Hillsdale 2036

Result Of Theft

In September I was unfortunate enough to have my rig and computer (Commodore 128D) stolen. I thus have a problem in that I have on disk all my contacts (about 250) and cannot access them.

If there is some kind person out there who owns a "128" and a printer, who would be willing to print out the list of contacts, I would be happy to pay the kind Samaritan or donate some 128 software and other goodies.

Bob Ross-Wilson VK2FIT
111 James St Leichhardt 2040
Phone 02 339 8111 (W)
02 550 0130 (H)

QSL Cards

In reply to Neil Penfold's letter in AR of Nov 1989, you are not the only one Neil, I have sent out cards direct with SAE and ample return postage and have had the cards returned via the buro or not at all.

I just don't collect cards to put them in a shoe box. If I need a card for a particular prefix, zone or country be it for WAZ, DXCC or some other award, whenever possible or convenient I ask if the station QSLs and if the answer is yes, I mail a card direct with SAE and return postage, and that in some cases is the last I hear or see of it.

It is becoming very obvious that some stations are only interested in green stamps and IRCs and once received the card and SAE finish up in the WPB. I chased zone 23 for nine years and finally worked 3 stations. I was lucky to receive a card back from a young lad (17 years old) who was working the club station (JT1KAA) after 4 months, the other 2 have been outstanding for 9 months now (just as well I did not hold my breath) and still not received. One had IRCs and a green stamp for return postage.

There are several Russian states as well as a few others where QSLing is a big disappointment. So much for the well used phrase of 100% QSL. Also a kingsize brickbat to operators who take between 9 and 12 months to send their logs to their managers.

I won't worry about going for awards any more and I will still QSL but it will be on RECEIPT only unless it is for a DXpedition or a new country, and by the way I too am a little pistol.

Bill Vogel VK5NVW
16 Wandilla Street Largs North 5016

VNG Replies . . .

DH Watkins VK2DDR (AR Jan 1990, page 60) said that he has not seen a single benefit detailed which supports the reintroduction of VNG. In my VNG update, I did outline the sort of people who use VNG, but maybe I

should go through the exercise again.

First however, let's examine its worth in true government fashion by counting the number of contributors who were prepared to dip into their own pockets to resuscitate VNG and to keep it running. Since the VNG Users Consortium came into being in late February 1988, a total of seventy different contributors (organisations, clubs, societies and private individuals) have given the sum of $12586 altogether. They include a number of radio amateurs and short wave listeners, and I don't think I need to spell out the use to these groups of standard frequency and time signal services!

Another very important use of VNG is in earthquake seismology. Over 40 seismographs (earthquake recorders) in Australia rely on it to keep their clocks accurately on time so that we can determine the locations of earthquakes. The recent Newcastle earthquake demonstrates to eastern Australians the relevance of this occupation. Western Australians have already had two towns wrecked by earthquakes. We need earthquake assessments so that we can build safer buildings. The assessments must be based on good data.

Astronomers are also major users of VNG for timing occultations and for telescope pointing calculations. About 80 Australian amateur astronomers use it for their unpaid work which contributes to international science.

Other users include some radio stations, surveyors, navigators, geophysicists studying the earth's magnetic field, and electric power networks.

AUSLIG informs me that $12000 has also been pledged or contributed to it since its letter went out last June.

By the way, it is also relevant that VNG only broadcasts for nine out of 24 hours on 10 and 15 MHz. This gives people a clear run of 15 hours each day to glean whatever information they want from WWV/WWVH.

Marion Leiba (Dr) VK1VNG, VK1KNG
Honorary Secretary
VNG Users Consortiu

2m Intruders In SE Asia

Re Ian Berwick's (VK3ALZ) item in "Over to You" in Dec AR, I wish to point out the following. Having been to Indonesia 5 times in the last 15 months, I have observed that the use of Icom 2 metre hand helds by all types of authorities, including the Police is prolific. Literally millions of 2 metre hand helds are in use there by non-amateurs.

As for HF, they use any frequency they like, especially the international amateur bands. South East Asia is and always will be South East Asia, and despite assurances by their governments, they will do nothing about it. I'm afraid, old man, we are going to have to live with the interference, and there is nothing we can do about it. As for use of 2 metre hand helds, I'm sure we can say it won't affect us, but what about 10 million hand helds on 2 m jamming the satellites? When I was in Singapore once, many shops had literally hundreds of Icom IC2A hand helds, selling them as walkie talkies to parents for use by their kids.

I think Intruder Watch has a problem as big as someone trying to stop the waves in the ocean.

Barry McNeil VK2FP
3 Bella Vista St
Heathcote 2233

HF PREDICTIONS

Roger Harrison VK2ZTB
The Apogee Group

Welcome to AR's new HF Predictions column! I trust readers find the information presented here not only useful, but interesting, too.

For ease of use and to accommodate space restrictions in the magazine, I have provided predictions applicable for three major regions of Australia:

VK EAST. Covers the major part of NSW and Queensland.

VK SOUTH. Covers southern-NSW, VK3, VK5 and VK7.

VK WEST. Covers the south-west of West Australia.

For each of these regions I have selected six "terminals" to major continental regions of the world, or regions of particular interest, such as Australian Antarctica (VK ANTARCTIC). From time to time, I will include predictions to cover particular DXpeditions or other activities of special interest. This month, as there is to be a DXpedition to Bouvet Island in the south Atlantic during the early part of the month, I have included predictions for Bouvet.

Feedback from readers and users would be most appreciated - let me know what you feel is wrong, and what's right, about the paths, presentation or any other aspect.

THE CHARTS

These charts are different from those you see published elsewhere, and arguably more useful to the amateur fraternity as they give, effectively, the predicted signal/noise ratio for each hour and for selected bands.

The charts are organised in 24 rows, one for each hour UTC (first column on the left). Don't forget to add the appropriate number of hours for your time zone, including daylight saving where it applies. The next column give the MUF (maximum usable frequency) for each hour, followed by the field strength at the MUF, in decibels referred to 1 uV/metre (dBU). The column marked FOT gives the "optimum" frequency - the most reliable frequency for the path.

Then come five columns, one for each of five selected HF bands.

The numbers in the column represent predicted field strength at each hour in decibels referred to 1 uV/metre. Here it represents "raw" signal to noise ratio as urban noise levels are typically 1-2 uV/metre, but does not take into account the advantage offered by particular transmission modes. The results are based on a transmitter power of 100 W output, the use of modest 3-element beams or similar, and for "median" conditions. Where the results fall below -40 dB, no output is printed.

Enhanced conditions may improve S/N ratios by 9-15 dB. The use of CW or digital transmission modes show better results than SSB. If you've got 400 W output, you get a 6 dB improvements. Where conditions warrant it, I have deleted 28.5 MHz predictions and included 10.1 MHz. I general, providing predictions for the bands below 10 MHz is futile during this part of the solar cycle, except perhaps where DXpeditions are concerned.

The Bouvet Island predictions are different, being based on dipole antenna systems and they cover the bands scheduled to be activated. The predictions are calculated using a program known as "FTZ", for IBMs and compatibles, distributed by FT Promotions. (02) 818-4838.

Please turn over for charts.

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UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.1	-7	12.7	-16	-7	-7	-10	-17
2	21.0	-6	15.1	-24	-10	-6	-6	-10
3	20.8	-9	15.8	-33	-15	-9	-7	-9
4	23.5	-8	17.7	...	-20	-11	-7	-7
5	28.3	-6	19.8	...	-24	-13	-8	-6
6	29.1	-6	20.4	...	-26	-14	-8	-6
7	29.0	-6	20.3	...	-26	-14	-8	-6
8	29.1	-5	20.4	...	-24	-13	-7	-5
9	27.8	-4	20.3	...	-19	-10	-5	-4
10	26.0	-4	20.2	-34	-14	-7	-4	-4
11	24.1	-3	19.3	-25	-9	-4	-3	-5
12	22.1	-2	17.6	-16	-4	-2	-3	-7
13	20.8	1	16.5	-7	0	0	-3	-9
14	19.6	4	15.5	2	5	3	-3	-11
15	18.7	9	14.7	12	9	5	-3	-13
16	18.0	12	14.0	17	12	6	-4	-15
17	17.1	14	13.2	18	11	4	-7	-19
18	16.4	15	12.5	19	11	2	-10	-23
19	16.0	15	11.9	19	10	2	-11	-25
20	16.8	15	11.5	20	12	3	-9	-23
21	15.8	10	10.9	12	6	-2	-14	-27
22	15.3	4	10.6	4	1	-6	-16	-29
23	15.0	-3	10.4	-3	-4	-8	-18	-30
24	16.0	-7	11.1	-10	-6	-8	-15	-24

VK EAST — AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.2	-5	11.9	-10	-5	-7	-13	-22
2	20.3	-4	14.5	-15	-5	-4	-7	-13
3	20.1	-7	15.2	-24	-10	-6	-7	-11
4	22.7	-7	17.1	-34	-14	-8	-6	-8
5	26.6	-6	18.9	...	-18	-10	-6	-6
6	26.9	-6	19.1	...	-20	-11	-7	-6
7	26.7	-7	18.9	...	-21	-12	-7	-7
8	26.4	-7	18.7	...	-20	-11	-7	-7
9	25.3	-7	18.1	-40	-18	-10	-7	-7
10	23.8	-6	16.8	-32	-14	-8	-6	-8
11	22.0	-6	15.4	-24	-10	-6	-7	-10
12	20.2	-5	14.1	-17	-7	-5	-8	-14
13	18.6	-4	12.9	-10	-4	-5	-10	-18
14	17.2	0	11.9	-1	0	-4	-12	-23
15	16.2	5	11.5	7	3	-4	-15	-28
16	15.6	10	10.8	12	5	-4	-18	-33
17	14.7	12	10.2	13	3	-8	-23	-40
18	14.3	13	10.0	13	2	-9	-25	...
19	14.0	14	9.9	13	2	-10	-27	...
20	15.0	14	10.6	16	5	-6	-21	-38
21	15.0	12	10.5	14	4	-6	-21	-37
22	14.6	6	10.2	7	0	-9	-23	-39
23	14.3	0	10.0	0	-4	-12	-24	-39
24	15.2	-4	10.8	-5	-5	-10	-19	-32

VK STH — AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.5	5	13.9	3	5	2	-5	-14
2	21.2	2	15.8	-4	2	2	-1	-7
3	23.9	2	18.8	-14	-2	2	1	-2
4	29.2	2	22.3	-26	-7	-1	2	2
5	31.4	0	23.3	-34	-12	-4	0	1
6	31.4	-1	25.8	-39	-15	-6	-1	0
7	30.9	-2	25.3	...	-17	-8	-2	-1
8	30.8	-2	25.1	...	-17	-8	-2	-1
9	30.2	-2	24.6	-39	-16	-7	-2	-1
10	29.4	-1	23.8	-34	-13	-5	-1	-1
11	27.9	0	23.0	-26	-8	-2	0	-1
12	26.1	1	21.0	-16	-2	1	2	-1
13	24.2	3	19.4	-4	4	5	3	-2
14	22.2	6	17.7	6	9	7	2	-4
15	20.9	10	16.6	15	13	9	2	-7
16	19.8	12	15.6	20	15	9	1	-10
17	18.8	14	15.2	21	15	8	-2	-13
18	18.1	14	14.1	22	15	7	-4	-16
19	17.3	15	13.3	21	13	5	-7	-20
20	16.6	16	12.7	21	12	3	-10	-24
21	16.2	16	12.3	20	11	2	-11	-26
22	17.3	16	13.0	22	14	5	-7	-20
23	17.8	14	13.6	20	13	6	-4	-16
24	17.4	8	13.2	10	8	2	-7	-18

VK WEST — AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.6	3	25.1	-23	-5	2	5	5
2	31.1	3	23.5	-26	-6	1	4	4
3	31.5	3	26.1	-26	-7	1	4	5
4	31.2	3	25.7	-25	-6	1	5	5
5	30.8	4	25.3	-22	-4	3	5	5
6	30.2	4	24.7	-16	-1	5	7	5
7	29.1	5	23.7	-8	4	8	8	6
8	28.0	8	23.3	4	11	12	11	7
9	26.9	11	21.8	19	20	18	14	8
10	25.8	12	20.7	23	22	19	13	7
11	24.9	12	19.9	26	23	19	12	5
12	24.7	13	19.6	27	24	19	12	5
13	24.3	14	19.2	30	25	20	12	4
14	23.5	14	19.1	30	24	18	11	2
15	22.0	14	17.2	28	22	15	6	-4
16	20.7	14	16.1	27	20	12	2	-9
17	19.3	14	14.9	25	17	8	-3	-16
18	18.0	14	13.8	23	13	4	-9	-24
19	18.0	14	13.8	23	13	4	-9	-24
20	17.1	12	13.3	19	9	-2	-16	-33
21	20.3	7	15.3	13	11	5	-3	-14
22	27.8	6	21.5	1	9	10	8	5
23	29.8	5	23.6	-11	3	7	8	6
24	30.0	4	24.2	-18	-2	4	6	5

VK EAST — ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	31.1	2	24.9	-28	-8	-1	3	3
2	31.7	2	25.8	-32	-10	-2	2	3
3	31.7	2	25.5	-33	-11	-2	2	3
4	31.6	2	26.1	-32	-10	-2	2	3
5	31.0	2	25.5	-29	-9	-1	3	3
6	30.7	2	25.1	-24	-6	1	4	4
7	30.0	3	24.5	-16	-1	4	6	5
8	28.9	5	23.5	-5	6	8	8	5
9	27.5	9	22.2	17	19	17	13	8
10	25.8	11	20.8	24	22	18	12	5
11	24.2	11	19.4	25	21	17	10	1
12	22.5	11	17.9	25	20	14	5	-4
13	21.6	12	17.2	25	19	12	3	-8
14	20.8	12	16.4	26	18	11	1	-11
15	20.0	12	15.7	24	17	9	-3	-15
16	19.1	12	15.0	23	15	6	-6	-20
17	18.3	12	14.2	22	12	3	-10	-25
18	17.3	12	13.3	20	9	-1	-16	-32
19	16.8	12	12.8	19	8	-4	-19	-37
20	17.6	12	13.3	21	10	0	-14	-30
21	20.2	7	15.1	14	11	5	-4	-15
22	24.6	4	18.7	-1	6	6	3	-2
23	28.5	3	22.0	-14	0	8	5	3
24	30.6	3	24.0	-22	-5	2	4	4

VK STH — ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.7	3	22.7	-17	-2	3	5	3
2	29.0	2	23.3	-22	-4	2	4	3
3	29.5	2	24.1	-24	-6	1	3	3
4	29.7	2	22.4	-25	-6	0	3	3
5	29.9	3	24.7	-24	-6	1	4	3
6	29.5	3	24.3	-21	-4	2	4	4
7	29.2	4	23.9	-16	-1	4	6	4
8	28.5	5	23.3	-9	3	7	7	5
9	27.5	7	22.4	3	10	11	10	6
10	26.4	11	21.9	23	22	19	14	7
11	25.1	12	20.3	27	23	19	13	5
12	23.9	12	19.2	27	23	18	10	1
13	22.7	13	18.1	27	22	16	7	-3
14	22.2	13	17.7	28	21	15	6	-4
15	21.7	13	17.2	28	21	14	4	-6
16	21.0	13	17.0	27	19	12	2	-10
17	19.8	13	15.5	25	17	9	-3	-16
18	18.8	12	14.6	23	14	5	-7	-22
19	17.7	12	13.6	21	11	1	-14	-30
20	16.8	12	12.8	19	8	-4	-20	-38
21	17.0	11	13.0	19	7	-4	-20	-38
22	19.4	10	15.3	19	13	5	-5	-18
23	23.6	4	18.1	-1	6	6	2	-4
24	27.1	4	21.1	-10	2	5	5	2

VK WEST — ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.1	-29	9.5	-20	-15	-17	-26	-38
2	11.2	-40	8.8	-22	-16	-19	-27	-38
3	11.4	...	9.0	-32	-23	-24	-31	...
4	13.6	-34	10.5	-30	-17	-15	-18	-25
5	17.8	-22	14.2	...	-21	-15	-14	-17
6	22.7	-13	18.1	...	-25	-16	-11	-11
7	27.1	-7	21.7	...	-27	-15	-9	-7
8	29.6	-4	23.9	...	-24	-13	-6	-4
9	29.7	0	24.1	-39	-15	-6	-1	0
10	28.5	4	23.0	-20	-3	2	5	4
11	27.2	7	21.9	-5	5	8	8	6
12	26.2	9	20.9	7	12	13	11	7
13	25.8	11	20.5	14	17	16	12	8
14	25.3	13	20.1	21	21	18	14	8
15	24.6	15	19.3	25	23	19	14	7
16	23.0	15	18.0	26	23	18	12	4
17	21.8	13	16.9	25	20	14	6	-3
18	19.2	13	15.1	23	15	8	-3	-15
19	16.5	13	12.9	19	9	-1	-15	-30
20	14.8	14	11.5	15	3	-9	-25	...
21	13.6	8	10.5	7	-4	-15	-32	...
22	13.1	-1	10.4	-2	-8	-17	-33	...
23	13.0	-12	10.1	-10	-11	-17	-29	...
24	12.9	-20	10.1	-16	-13	-17	-26	-39

VK EAST — EUROPE S.P.

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	12.3	-24	9.6	...	-17	-14	-18	-27
2	11.4	-35	8.9	...	-20	-15	-18	-26
3	11.7	...	9.2	...	-27	-18	-19	-26
4	14.3	-32	10.9	...	-32	-18	-15	-17
5	19.0	-20	15.1	...	...	-23	-16	-13
6	24.4	-12	19.6	...	...	-29	-18	-12
7	29.0	-7	23.3	...	...	-33	-19	-11
8	28.4	-6	23.1	...	...	-32	-18	-10
9	27.0	-6	22.3	...	...	-27	-15	-8
10	25.2	-5	20.3	...	...	-18	-10	-5
11	23.4	-3	18.8	...	-26	-9	-4	-3
12	21.5	1	17.2	-39	-9	0	1	-1
13	20.4	6	16.2	-12	4	7	5	0
14	19.4	9	15.3	6	13	11	7	-1
15	18.5	12	15.0	18	18	13	7	-3
16	17.9	14	13.9	22	20	13	6	-5
17	17.1	14	13.2	24	20	12	4	-8
18	16.3	15	12.5	25	20	11	1	-12
19	16.0	15	12.1	25	19	10	0	-14
20	15.2	14	11.7	24	16	5	-6	-22
21	13.9	12	10.7	17	11	-1	-13	-30
22	13.4	4	10.5	3	4	-5	-16	-32
23	13.3	-4	10.2	-14	-4	-8	-16	-30
24	13.2	-13	10.2	-29	-11	-11	-16	-27

VK STH — EUROPE S.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.5	-11	9.7	-9	-13	-22	-36	...
2	11.6	-24	9.0	-16	-17	-23	-36	...
3	11.9	-31	9.4	-21	-17	-21	-30	...
4	14.6	-26	11.1	-28	-17	-16	-21	-29
5	19.6	-17	15.7	-40	-20	-14	-14	-17
6	25.3	-10	20.3	...	-25	-15	-10	-10
7	29.9	-6	24.1	...	-29	-17	-9	-7
8	31.7	-5	25.3	...	-30	-17	-9	-5
9	31.0	-3	25.3	...	-28	-15	-7	-4
10	29.9	-3	24.3	...	-24	-12	-5	-3
11	28.6	-1	23.1	-38	-15	-7	-2	-1
12	27.1	2	21.8	-19	-4	1	3	1
13	25.6	6	20.5	-1	7	8	6	2
14	24.1	9	19.3	13	14	13	8	2
15	23.5	12	18.7	23	20	16	10	2
16	22.9	13	18.1	24	20	16	9	1
17	22.1	13	17.4	25	20	15	8	-1
18	20.6	11	16.0	23	17	10	0	-11
19	17.6	12	13.6	19	10	1	-11	-26
20	15.5	12	11.9	16	4	-7	-22	-40
21	14.2	12	10.8	12	-1	-14	-32	...
22	13.6	13	10.6	11	-4	-17	-37	...
23	13.4	9	10.3	8	-5	-18	-37	...
24	13.4	-1	10.3	-1	-8	-18	-34	...

VK WEST — EUROPE S.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.9	-6	21.0	...	-22	-12	-7	-6
2	25.5	-5	19.3	-35	-15	-8	-5	-6
3	23.2	-4	17.5	-23	-9	-4	-4	-8
4	21.1	-2	15.8	-12	-3	-2	-5	-11
5	19.6	1	14.7	-2	2	0	-6	-14
6	18.5	5	13.8	7	6	1	-7	-18
7	17.6	10	13.3	16	9	2	-9	-22
8	16.7	12	12.5	17	9	0	-13	-27
9	16.0	13	12.1	17	7	-2	-16	-32
10	14.4	14	11.0	15	3	-9	-26	...
11	12.9	14	9.9	11	-4	-18	-38	...
12	12.8	15	9.9	10	-4	-18	-39	...
13	15.9	14	11.8	18	8	-2	-17	-33
14	21.7	11	16.8	22	17	12	4	-6
15	19.5	9	15.1	10	10	7	0	-8
16	20.0	2	15.4	-3	2	2	-2	-9
17	18.8	-5	14.4	-16	-6	-5	-7	-13
18	19.1	-11	14.5	-29	-13	-9	-10	-14
19	21.6	-11	17.1	...	-20	-12	-9	-10
20	26.4	-8	20.2	...	-27	-15	-9	-7
21	30.4	-5	23.5	...	-32	-18	-9	-5
22	30.1	-5	23.5	...	-33	-19	-10	-6
23	30.1	-6	22.9	...	-32	-18	-10	-6
24	29.9	-6	22.6	...	-28	-16	-8	-6

VK EAST — NTH/CENT AMERICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.6	-5	21.6	...	-23	-12	-6	-5
2	26.6	-4	20.1	-37	-15	-8	-4	-5
3	24.7	-2	18.7	-24	-8	-3	-2	-5
4	22.9	-1	17.2	-13	-2	0	-2	-6
5	21.7	2	16.3	-2	3	3	-1	-8
6	20.6	5	15.4	6	7	5	-2	-10
7	19.6	9	14.9	14	11	6	-3	-13
8	18.3	11	13.8	18	12	5	-6	-18
9	17.2	12	13.0	18	10	2	-11	-25
10	15.3	13	11.7	16	5	-5	-20	-37
11	13.4	14	10.3	12	-2	-15	-34	...
12	13.1	14	10.1	11	-3	-17	-36	...
13	16.3	14	12.2	19	9	-1	-14	-30
14	18.2	12	14.2	17	12	5	-5	-16
15	17.3	5	13.3	5	4	-1	-9	-20
16	16.5	-5	12.6	-9	-4	-7	-13	-23
17	16.1	-14	12.2	-21	-11	-11	-15	-23
18	17.2	-18	12.8	-31	-16	-12	-14	-19
19	19.7	-17	15.5	...	-21	-14	-12	-14
20	23.9	-12	18.0	...	-27	-17	-11	-10
21	27.7	-8	21.2	...	-32	-19	-11	-8
22	30.2	-6	23.5	...	-34	-20	-11	-7
23	31.0	-5	23.9	...	-33	-19	-10	-6
24	30.3	-5	23.0	...	-29	-16	-9	-6

VK STH — NTH/CENT AMERICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.1	-6	21.2	...	-30	-17	-9	-6
2	25.6	-7	19.3	...	-24	-13	-8	-6
3	23.2	-8	17.5	...	-18	-10	-7	-7
4	20.9	-7	15.7	-29	-12	-7	-6	-9
5	19.4	-5	14.5	-19	-7	-5	-7	-12
6	18.2	-3	13.6	-10	-3	-3	-7	-15
7	17.4	1	13.1	-1	1	-2	-8	-18
8	16.6	6	12.4	6	4	-1	-10	-22
9	15.9	11	12.0	13	7	-1	-13	-27
10	14.4	14	11.0	14	5	-6	-21	-38
11	12.9	15	9.9	12	0	-13	-31	...
12	12.9	16	9.9	13	0	-13	-32	...
13	16.0	16	11.9	20	11	1	-12	-27
14	20.2	15	16.0	24	19	14	5	-4
15	19.4	10	15.7	12	12	8	1	-8
16	18.7	5	14.6	1	5	3	-3	-11
17	18.0	-3	13.9	-12	-3	-3	-7	-13
18	17.1	-12	13.1	-22	-10	-7	-10	-15
19	16.8	-19	12.7	-32	-15	-11	-11	-16
20	17.8	-21	13.4	...	-20	-13	-11	-14
21	20.4	-17	16.1	...	-25	-16	-11	-11
22	24.9	-11	18.9	...	-32	-19	-11	-8
23	28.8	-7	22.2	...	-37	-21	-11	-7
24	30.2	-6	22.8	...	-35	-20	-11	-6

VK WEST — NTH/CENT AMERICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.6	13	19.9	4	13	15	14	11
2	26.7	14	22.0	5	14	16	15	11
3	26.3	14	21.6	7	15	16	15	11
4	25.9	15	21.3	10	16	17	15	11
5	25.4	16	20.7	14	19	19	16	11
6	24.4	17	19.9	20	22	21	17	11
7	23.3	21	19.4	30	27	24	18	10
8	22.1	22	17.9	32	28	24	16	8
9	20.9	23	16.8	33	28	22	14	4
10	19.6	24	15.7	32	26	20	11	0
11	19.0	24	15.2	32	26	19	9	-2
12	18.4	24	14.6	32	25	17	7	-5
13	17.6	25	14.3	31	23	15	4	-8
14	16.7	25	13.1	30	21	12	0	-13
15	15.8	25	12.3	29	19	10	-4	-17
16	14.9	25	11.5	27	16	6	-8	-23
17	14.2	26	10.9	26	14	3	-12	-28
18	14.7	24	11.1	25	15	4	-10	-25
19	16.7	18	12.9	20	15	9	-2	-14
20	20.3	15	15.5	15	16	14	8	-1
21	23.5	14	18.2	11	16	16	13	7
22	25.2	14	19.9	8	15	16	14	10
23	25.8	13	20.6	6	14	15	14	10
24	26.4	13	20.9	5	13	15	14	11

VK EAST — STH PACIFIC

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	16.5	-2	13.3	-23	-4	-2	-6	-14
2	17.2	-2	13.9	-27	-5	-2	-4	-12
3	17.6	-2	14.2	-29	-6	-2	-4	-10
4	17.8	-2	14.5	-29	-6	-1	-3	-10
5	17.7	-1	14.1	-28	-6	-1	-4	-10
6	17.8	0	14.4	-26	-4	0	-3	-9
7	18.0	1	14.5	-22	-2	1	-2	-8
8	18.2	3	14.6	-16	1	3	0	-7
9	18.3	6	14.5	-7	6	6	2	-6
10	18.4	10	14.6	5	13	10	5	-4
11	18.1	13	14.6	16	18	13	6	-4
12	17.6	15	13.5	24	21	13	5	-7
13	16.9	14	12.3	25	20	10	0	-14
14	16.0	13	11.3	26	18	6	-5	-22
15	15.1	13	10.6	26	16	3	-10	-29
16	14.5	14	10.3	26	15	1	-14	-33
17	13.6	14	9.7	24	12	-4	-20	...
18	13.4	14	9.6	24	11	-5	-22	...
19	13.2	14	9.5	23	10	-7	-24	...
20	13.2	15	9.9	23	11	-5	-21	...
21	13.5	7	10.5	7	6	-5	-17	-35
22	14.0	2	11.0	-4	2	-4	-13	-28
23	14.7	-1	11.1	-12	-1	-4	-11	-23
24	15.7	-2	12.6	-19	-3	-3	-8	-18

VK STH — VK ANTARCTIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.9	0	13.6	-2	0	-3	-11	-20
2	15.1	-12	11.6	-14	-9	-12	-20	-31
3	14.3	-21	11.0	-22	-14	-16	-22	-32
4	18.2	-16	14.1	-31	-16	-13	-14	-19
5	25.5	-8	19.7	...	-21	-12	-8	-8
6	32.9	-4	25.3	...	-28	-15	-7	-4
7	33.5	-2	26.3	...	-31	-17	-8	-3
8	33.2	-2	25.7	...	-31	-17	-8	-4
9	32.5	-2	25.8	...	-29	-15	-7	-3
10	31.3	-2	25.5	...	-24	-13	-5	-2
11	29.9	-1	24.8	...	-17	-7	-2	-1
12	28.3	1	22.8	-24	-7	-1	2	1
13	26.7	5	21.4	-6	4	6	6	3
14	25.1	8	20.0	10	13	12	9	3
15	24.4	12	19.4	22	20	17	11	4
16	23.7	13	18.7	25	21	17	11	3
17	22.9	13	18.6	25	21	17	10	1
18	21.8	14	17.0	26	21	15	7	-2
19	20.8	14	16.1	25	19	13	5	-5
20	19.6	14	15.1	24	17	11	1	-9
21	18.8	15	14.3	23	16	9	-1	-13
22	19.5	14	14.8	24	17	11	1	-10
23	22.2	12	17.1	23	19	14	7	-2
24	20.6	7	15.5	10	9	6	-1	-10

VK WEST — MEDITERRANEAN

UTC	MUF	DBU	FOT	1.8	3.6	7.1	14.2	21.2
1	13.6	-26	10.2	...	...	...	-23	-21
2	13.[illegible]	-29	10.2	...	...	...	-25	-22
3	13.1	-32	10.0	...	...	...	-26	-23
4	14.0	-31	10.8	...	...	...	-30	-20
5	15.6	-27	12.1	...	...	...	-33	-16
6	17.6	-22	14.0	...	...	...	-35	-13
7	17.8	-20	14.4	...	...	...	-35	-12
8	18.0	-18	14.5	...	...	...	-32	-11
9	18.1	-15	14.4	...	...	...	-26	-9
10	18.2	-11	14.4	...	...	...	-20	-7
11	17.9	-9	14.1	...	...	...	-16	-5
12	17.5	-8	13.7	...	...	...	-13	-4
13	16.7	-7	13.0	...	...	...	-10	-5
14	16.1	-6	12.4	...	...	...	-7	-7
15	15.4	-4	11.9	...	...	-36	-4	-8
16	14.[illegible]	-2	11.3	...	...	-25	-2	-10
17	14.[illegible]	2	11.0	...	...	-6	2	-12
18	14.1	4	10.7	...	-24	5	4	-14
19	13.7	7	10.6	...	-9	10	7	-13
20	13.6	4	10.6	...	-37	1	4	-14
21	13.[illegible]	-7	10.7	...	...	-37	-5	-16
22	14.0	-13	11.1	...	...	...	-12	-15
23	14.7	-16	11.2	...	...	...	-17	-14
24	14.6	-20	10.9	...	...	...	-21	-17

VK EAST — BOUVET IS.

UTC	MUF	DBU	FOT	1.8	3.6	7.1	14.2	21.2
1	14.1	-17	10.7	...	...	...	-17	-17
2	13.8	-21	10.6	...	...	...	-20	-19
3	14.7	-21	11.4	...	...	...	-22	-16
4	16.4	-19	12.2	...	...	...	-26	-12
5	18.5	-16	14.7	...	...	...	-28	-11
6	18.4	-16	15.2	...	...	...	-29	-10
7	18.5	-15	15.2	...	...	...	-29	-10
8	18.7	-14	15.3	...	...	...	-28	-9
9	19.0	-12	15.4	...	...	...	-24	-8
10	19.0	-9	15.3	...	...	...	-19	-6
11	19.2	-6	15.4	...	...	...	-14	-4
12	18.9	-6	14.2	...	...	...	-11	-4
13	18.2	-5	13.0	...	...	...	-8	-4
14	16.8	-5	11.9	...	...	...	-7	-6
15	15.8	-4	11.5	...	...	-35	-4	-8
16	15.3	-1	10.9	...	...	-17	0	-8
17	14.3	2	10.2	...	...	-5	2	-13
18	14.1	5	10.2	...	-22	6	5	-13
19	13.9	6	10.1	...	-8	10	6	-14
20	14.5	7	10.8	-38	2	14	8	-9
21	14.4	1	11.3	...	...	-14	1	-9
22	14.4	-4	11.4	...	...	-36	-4	-10
23	14.8	-9	11.5	...	...	...	-10	-11
24	14.3	-14	10.8	...	...	...	-14	-16

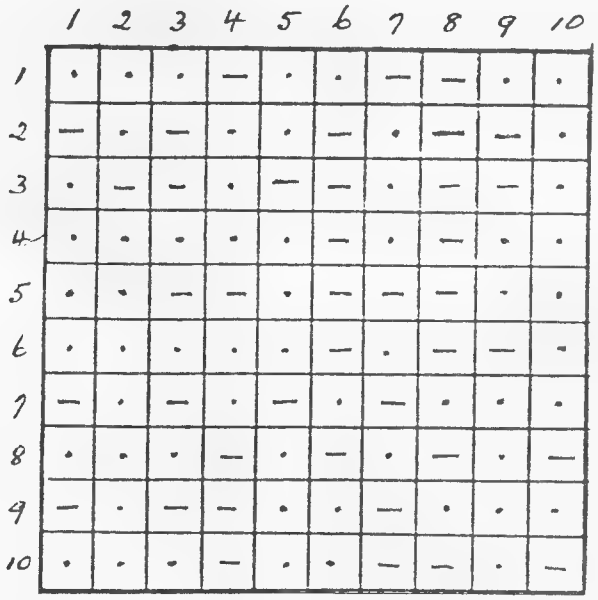
VK STH — BOUVET IS.

UTC	MUF	DBU	FOT	1.8	3.6	7.1	14.2	21.2
1	14.0	-12	10.5	...	...	...	-12	-17
2	13.7	-18	10.3	...	...	...	-16	-19
3	14.7	-20	11.1	...	...	...	-21	-16
4	16.4	-19	12.0	...	...	...	-26	-13
5	19.2	-16	14.6	...	...	...	-30	-12
6	21.5	-13	16.4	...	...	...	-32	-14
7	22.6	-12	17.0	...	...	...	-33	-13
8	22.8	-12	17.4	...	...	...	-33	-13
9	23.1	-11	17.5	...	...	...	-31	-12
10	23.3	-10	17.6	...	...	...	-28	-11
11	23.3	-8	17.5	...	...	...	-22	-8
12	23.4	-5	16.7	...	...	...	-14	-5
13	22.2	-4	15.3	...	...	...	-8	-3
14	20.3	-2	14.0	...	...	...	-3	-2
15	18.8	-1	12.9	...	...	-30	0	-1
16	17.5	2	12.0	...	...	-11	4	-1
17	16.5	5	11.3	...	-22	8	8	-2
18	15.9	6	10.9	...	-7	12	9	-4
19	14.9	7	10.3	-38	3	15	8	-8
20	14.5	7	10.1	-21	9	17	8	-10
21	13.9	7	9.9	-20	9	17	7	-15
22	13.7	7	10.2	-20	9	17	7	-16
23	13.5	1	10.1	...	...	-9	1	-18
24	14.3	-6	10.6	...	...	-37	-6	-15

VK WEST — BOUVET IS.

Solution To Morseword No.35

Across: 1 viz. 2 cap 3 Wang 4 seal 5 image 6 sing 7 kale 8 start 9 yeas 10 stunt
Down: 1 Lear 2 eases 3 warn 4 dram 5 fits 6 wore 7 dry 8 monk 9 wins 10 sift



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FOR SALE — NSW

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FOR SALE — VIC

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KENPRO KR1000S KR800S full English instruction manual $20 Box 566 PO Morphett Vale SA 5162.

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KEYBOARD 7 bit parallel ASCII suit Xitex RTTY decoder. Receiver 136-138 for weather satellite reception. Paul VK2AHB ph (02) 449 9212.

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CIRCUIT DIAGRAM or manual for RACAL RA17L for copying pay costs. G.Himolij 118 Wilsons Rd, Newcomb Vic 3219. Ph (052) 48 1410.

TRAYS and HARNESS for ex-Army C11/R210 complete wireless set WS19MKII vibrator model. John Bennett VK3ZA QTHR (054) 55 1234.

FM UNIT for TS-430S with connecting leads etc. Reasonable price paid. Contact Phil VK3KMZ on (059) 64 7486.

YAESU FT-7 transceiver prefer in very good order. Ron VK3OM QTHR (059) 44 3019.

WANTED — QLD

COMPONENT VALUES for 1946 Army 128 set by WWII signaller VK4EF 97 Jubilee Tce, Bardon QLD 4065 ph (07) 366 1803 AH Please.

INFORMATION copy of circuit diagrams for PLESSEY TS6802 also TSG402 cro. R.Male 13 Henzell St, Redcliffe 4020 (07) 284 6432.

HAMADS

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

*Eight lines free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclosed a mailing label from this magazine with your Hamad.

*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.

*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.

*QTHR means address is correct as set out in the WIA current Call Book.

*A courtesy note will be forwarded to acknowledge that the ad has been received.

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❑ Miscellaneous

❑ For Sale

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State: .....

VZ-300 disk drive, & VZ-300 disk controller. Eddy VK4-AVG QTHR (070) 61 4517.

WANTED — SA

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WANTED — WA

EIMAC 4CX1000A tube unused (098) 44 1169 or VK6MK QTHR.

ZLILH SSTV system or ROBOT 400 — Brian VK6ZD (09) 445 1412 B/H (09) 439 9030.

YAESU MOBILE ANTENNA for 14 MHz (RSL 14). VK6LT QTHR. Bill (09) 457 1080.

WANTED intruder watch observers in VK6 free tapes logs and assistance available contact VK6RO Graham on (097) 451 3561 or QTHR.

DON'T

buy stolen equipment - check the serial number against the WIA stolen equipment register first.

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It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

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HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

Call Sign (if applicable): .....

Address: .....

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State and Postcode: .....

FT-736R High Performance VHF/UHF Base Station Transceiver

The sky's not even the limit for the FT-736R! This base station rig is the most complete, feature packed radio ever designed for the serious VHF/UHF operator, whether your interest is talking through the local repeater or working the world via satellite. As standard, it provides 25 watts output on the 2 metre and 70cm bands in SSB, CW, or FM modes, and can be expanded to also cover the 6 metre and 23cm bands by installing optional modules as required. Some of its many features include . . .

- Flexible frequency control, with keyboard frequency entry, 115 general purpose memories, 10 full-duplex crossband memories, 2 independent VFO's per band, band/memory/mode selective/limited-band scanning functions, as well as 2 full-duplex VFO's which can have their transmit and receive frequencies (and modes) tuned independantly or tuned synchronously for satellite operation.
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- **2 Year Warranty** D-2920

Limited stocks!

$2695

or $2995 with 2m/70cm/6m modules (D-2925 only)

Bonus MD-1 Desk Mic!

Optional 6m module $475
Optional 23cm module $899

Save $169

FT-4700RH Dualband Mobile Transceiver

Continuing the tradition started by Yaesu with the FT-2700RH, the new FT-4700RH dualband 2M/70cm FM transceiver now provides higher levels of performance, while offering even better value for money!

Features include 50 watts output on 2 metres (144-148MHz), and 40 watts output on 70cm (430-450MHz), with an inbuilt coding fan for long term reliability. True full-duplex crossband operation is supplemented by dual band simultaneous reception or auto-muting reception (with independant squelch and mixing balance), so you can listen for calls on both bands simultaneously, or work someone on one band while also listening on the other band. The **Bonus** YSK-4700 controller cable allows the main body of the transciever to be installed under a seat, while the front panel/controller mounts conveniently on the dashboard. On the control panel, the bright amber back-lit LCD shows both VHF and UHF frequencies and signal strengths, and all controls have back-lit labels for clear readability, with a dimmer switch for nightime viewing. A total of 20 memories and 5 selectable tuning steps make frequency selection easy, while the advanced scanning features allow quick detection of signals on either, or both bands. And all this is backed up by our exclusive 2 year warranty, the longest in the industry.

D-3300

$1195

With Bonus

D-4207 2m 5/8λ antenna
D-4030 70cm Co-linear antenna
D-4516 Antenna Bases x 2
D-3301 YSK-4700 Extension Cable

Save $195

DICK SMITH ELECTRONICS

WITH ALL THE FEATURES IN ICOM'S NEW MOBILE TRANSCEIVERS, IT'S A WONDER THEY'RE STILL MOBILE.

ICOM have packed so many functions into the IC228A and IC2400A mobile transceivers, you'd think there was no way you could still make them so compact. (It might explain why nobody else has made a transceiver with so many features).

One of the features both transceivers share is back lit control knobs for visibility in bad lighting conditions.

There are various power outputs across the range, from 25W to 45W.

For novices, the 228A can be reduced to 10W.

The programmed Scan function scans all frequencies between two programmable set frequencies, while the Memory Scan function scans all memory channels except, of course, those you lock out.

Thanks to the pocket beep, you'll never miss a call. By installing a UT-40 Tone Squelch Unit (this is sold separately) the transceiver functions as a pager. When the frequency of a received tone equals the tone frequency you set, a thirty second alarm is emitted over the speaker.

As for monitoring the input frequency when you work a repeater, that's as simple as pushing the Monitor Switch on the front panel to open the squelch and check the frequency.

Every five seconds, Priority Watch in the IC2400A monitors the operating Channel, and one or all memory channels in succession. And that's while you operate! No longer do you have to flip back and forth between frequencies.

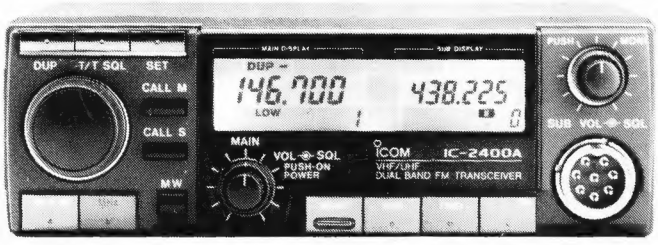
While the IC228A has 20 memory channels the more advanced IC2400A has 40, plus two call channels. Each channel stores all the information required to work a repeater.

With the IC2400A there are 20 double-spaced memory channels for 2 metres and 70 cm.

What's more, the IC2400A offers full duplex facility. Which means you can now simultaneously transmit on one band and receive on the other. You never have to wait for a long "over". You have full "break in". In fact, you can talk as easily as talking over the phone.

With all these functions in one small compact mobile, it really is a wonder they're still so compact and mobile.

IC228A



IC2400A

Call ICOM on (008) 338 915 for details on ICOM products and your nearest stockist.
Melbourne callers (03) 529 7582. ICOM Australia Pty. Ltd., 7 Duke Street, Windsor, 3181.

ICOM

ICOM Australia's warranty is only applicable to products purchased from their authorised Australian Dealers.

*According to model chosen.